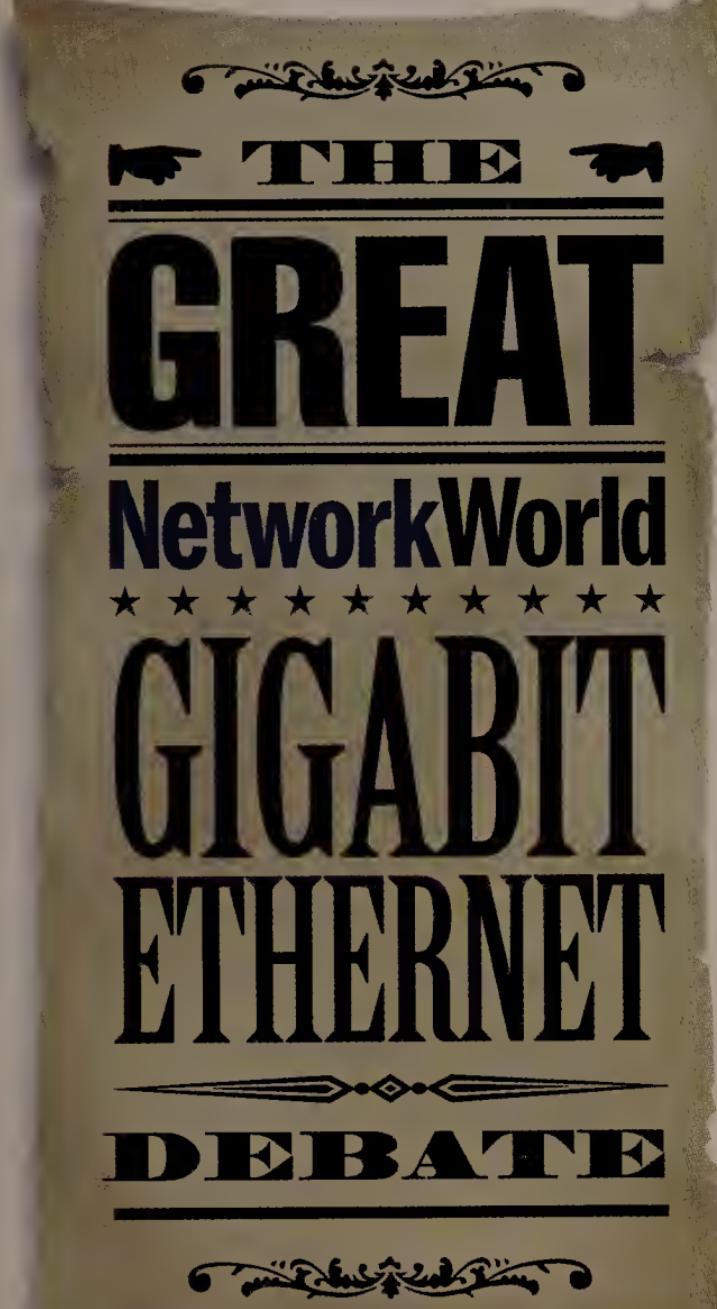


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THE NEWSWEEKLY OF ENTERP

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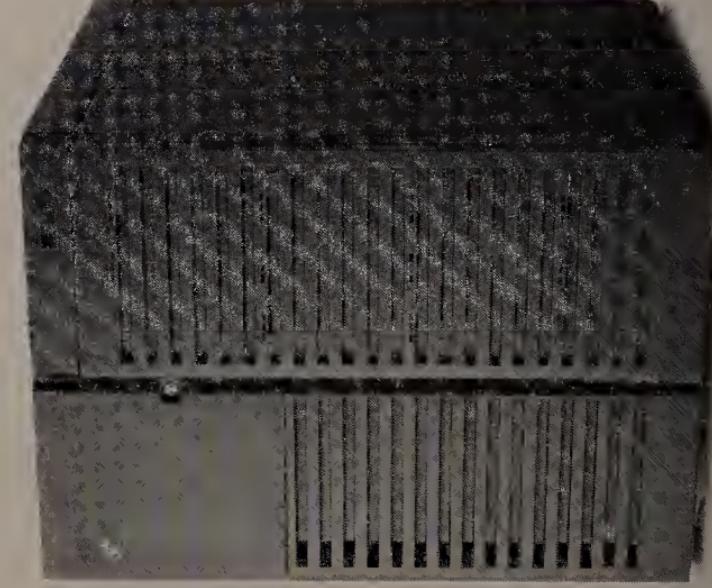
Keep this slot open when you do your NetWorld+Interop planning. That's when we'll bring together a panel of experts and representatives from the industry's top Gigabit vendors for a frank, open debate about the future of this promising technology.

Participants from Alteon Networks, Bay Networks (which recently acquired Rapid City), Extreme Networks, Foundry Networks, Prominet and 3Com will field questions from Kevin Tolly of The Tolly Group, Don Miller of Dataquest, and *Network World*'s own John Gallant and Jodi Daniels. Don't miss it.



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THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



STEVE BURNS

ISPs put a premium on 'Net performance

By Denise Pappalardo

If deploying business-critical applications over the Internet makes you nervous, new services and guarantees being rolled out by UUNET Technologies and Sprint Corp. may ease your mind.

UUNET told *Network World* it will announce an Internet access service later this month that will let users better control their bandwidth.

And Sprint will announce this week new service-level agreements (SLA) that will compensate its customers if the carrier does not live up to its promises.

Both services will give users the control and predictability they need to take advantage of the Internet. Lack of such control is largely responsible for limiting corporate use of the Internet as a wide-area transport alternative, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm.

UUNET, a WorldCom, Inc. subsidiary, is rolling out a new service called Tiered T-3 Class Based Queuing (CBQ) and Burstable T-3 CBQ services to

address quality-of-service (QoS) issues, said Mike O'Dell, vice president and chief scientist at UUNET. The services will let network managers set their own class-of-service parameters for Internet access bandwidth.

For example, if a user subscribes to UUNET's Tiered T-3 CBQ service with a port speed of 32M bit/sec, he could carve out 15M bit/sec for Portable Document Format traffic, 7M

See QoS, page 65

Go online for more QoS information:

- An analysis of the need for policy-based management
- Tips for monitoring service-level agreements
- An overview of Cable & Wireless' IP service guarantee



U.S. Treasury Dept. to unveil tax scheme for cyberspace

By Ellen Messmer
Washington, D.C.

The Department of the Treasury soon will unveil a plan for taxing digital content sold and delivered over the Internet to overseas buyers.

The new tax policy, currently applied only to over-the-'Net sales of software but next year expand-

ing to include all digitized content, would eliminate the double taxation companies now face: They have to pay taxes to the U.S. and foreign governments for goods sold abroad.

Under the plan, U.S.-based companies will have to pay income tax to Uncle Sam for

See Treasury, page 66

NEWSPAPER \$5.00

Cabletron to enter gigabit router game

By Jodi Daniels

Rochester, N.H.

Cabletron Systems, Inc. is about to get a whole new look.

The hub and switch maker plans to break from its routerless past and roll out a gigabit switching router by mid-1998, according to sources close to Cabletron.

Nearer term, the company will unveil a family of Gigabit Ethernet modules for its existing switches and hubs at NetWorld+Interop 97 in Atlanta next month.

While gigabit gear has been expected, the router plan caught observers by surprise. After all, what does Cabletron know about building routers?

Well, it knows enough to look for help, which explains why the company has taken what sources estimated to be a 20% to 40% stake in router start-up YAGO Systems, Inc., of Sunnyvale, Calif. Cabletron confirmed that it has invested in YAGO, but declined to disclose the extent of the investment.

"This would give Cabletron, for the first time, a router story," said Skip MacAskill, an

The season for switches

Look inside for these other stories on new network switches:

3Com readies its next-generation Layer 3 switch.
Page 10.



Start-up FlowWise joins the Layer 3 switch crowd.
Page 15.

Hughes Network Systems preps a cell switch with a 20G bit/sec backplane.
Page 8.



Olicom beefs up its token-ring switch line.
Page 15.

analyst with consultancy Gartner Group, Inc. in Stamford, Conn. "We've been trying to tell Cabletron for years that they

need routing, so to see Cabletron acknowledge the fact that routers are a key part

See Router, page 12

LAN switch war heating up

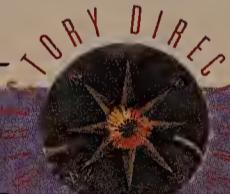
Cisco and Bay do battle on 10M/100M switch front.

By Jim Duffy

The battle between internet network giants Cisco Systems, Inc. and Bay Networks, Inc. is heating up in the autosensing Ethernet switch arena.

Cisco has quietly rolled out a higher density addition to its Catalyst 2900

10M/100M bit/sec switch line that includes a slew of software-based services, such as fault- See Cisco, page 65



SPECIAL SECTION

Directories branch out

Directories are becoming the lifeblood of the network, playing a role in everything from security to network and systems management, promising to ease your administrative burden in the process.

That is, if you manage to get your chosen directory integrated with your existing systems, applications and equipment. Novell, Microsoft and a host of third parties all claim they can do the job. Can they, or are they just blowing smoke?

In this special section, we'll help you assess your options and get you pointed in the right direction. Coverage begins on page 45.



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GOING LIVE

Open Market's Live-Commerce adds life to electronic catalogs. Page 31.

LAYERING IT ON

3Com debuts its next-generation Layer 3 switch, the CoreBuilder 3500. Page 10.



THAT ETERNAL DREAM

ACT Networks CEO Martin Shum wants to achieve Universal Access. Page 66.

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To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.

9999

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This Week

Only on Fusion



Keeping Current. Hold the (Internet) phone! Internet telephony has a bright short-term future, but it could become a victim of its own success. **DocFinder: 3824**

IP telephony. MCI honcho and Internet pioneer Vint Cerf predicts that half of all voice calls will be carried over the 'Net by 2010. Cerf also predicts that reconciling conflicting Internet laws in different countries will prove more difficult than ramping up the network to handle dramatically increased traffic. **DocFinder: 3826**

Gigabit Ethernet. What would you ask the executives of Gigabit Ethernet vendors? We're hosting a debate between them at NetWorld+Interop 97. Let us know your questions — and get a peek at Fusion's new conferencing software at the same time. **DocFinder: 3825**

From the front page

Switch routers. Read our front-page story on Cabletron's push into routers, then come online for overviews of other vendors' plans for gigabit switch routers. **DocFinder: 3822**

HOW TO GET ONTO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

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- 8 **Netscape and Microsoft** have confirmed security holes in their browsers in recent weeks.
- 8 **Hughes** has new frame relay, ATM switches.
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Saying goodbye to TDM

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Now you have to determine whether Novell's NDS or Microsoft's ADS will best integrate with your enterprise. Page 45.

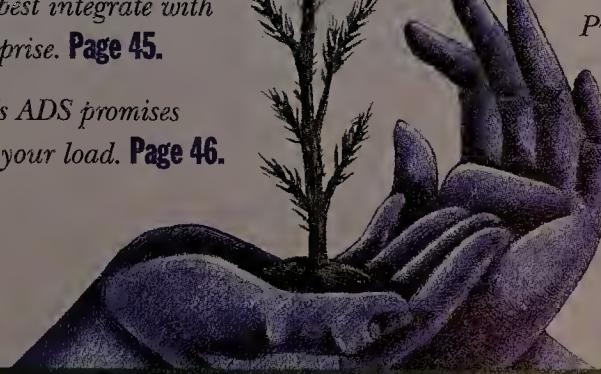
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News briefs, September 15, 1997

Microsoft targets the enterprise

Microsoft Corp. this week will roll out its high-end Windows NT Server 4.0 suite targeted for enterprise networks. The Enterprise Edition of Windows NT Server 4.0 comprises Microsoft Cluster Server, which handles two-node failover; Transaction Server; and Message Queue Server. Also expected in the version are enhancements to Index Server, support for HTTP 1.1 and the Microsoft Certificate Server. Microsoft has said this product will cost approximately \$4,000.

Ascend plays Big Brother

Ascend Communications, Inc. this week will announce NavisXtend, server-based applications for its Ascend 9000 and 500 switches, which include tools that customers can use to monitor levels of service delivered by service providers. NavisXtend supports the monitoring of links, congestion, usage and availability. It also can produce statistical reports on network performance. Other NavisXtend tools can streamline provisioning of services and improve carrier tracking of billing information. NavisXtend applications cost between \$7,500 and \$15,000.

Tivoli refugees starting up again

A group of former Tivoli Systems, Inc. and NeXT Software, Inc. employees have joined forces to start up Motive Software, Inc. in Austin, Texas, which plans to release network products around the start of 1998. Founders include Scott Harmon, Tivoli's former vice president of marketing and strategy; Tom Bereiter and Brian Vetter, two principal Tivoli architects; Mike Maples Jr., former director of product marketing at Tivoli; and Scott Abel, formerly vice president of custom applications development at NeXT. Board members include Eric Jones, formerly Tivoli's chairman, and Mike Maples Sr., a former top Microsoft Corp. executive.

Motive has received \$4.8 million in venture funding from Austin Ventures, Accel Partners and SSM Venture Partners. Officials declined to describe what sort of products the company is developing, but one clue is that the firm is hunting for Windows NT Server programmers.

Toiling in the Java WorkShop

Sun Microsystems, Inc.'s SunSoft division tomorrow will announce the release of Java WorkShop 2.0, an integrated development environment for building portable JavaBeans components, Java applications and Java applets. The new WorkShop supports the latest Java Development Kit 1.1 standards and the new JavaBeans component model. It also features a Java profiler that Sun officials said will help developers find performance bottlenecks in applications. Sun released WorkShop 1.0 in August 1996. Java WorkShop 2.0 is available on CD for \$99.

Cisco pumps out token-ring switches

As expected, Cisco Systems, Inc. last week unveiled its second-generation token-ring switches (NW, Aug. 4, page 1). The stackable Catalyst 3900 features 20 ports, two expansion slots for ATM and Fast Ethernet uplinks at a price of \$8,995. Up to eight Catalyst 3900s can be stacked, and the switch is available now. A token-ring switch module for the Catalyst 5000 features 16 ports at a price of \$13,995 for copper and \$19,995 for fiber. The copper version will ship in the fourth quarter, while the fiber blade will ship in the first quarter of 1998.

Getting to the basics

Network World's Technical Seminar series continues this fall with the Essentials of Networking and Data Communications. Led by Ray Horak of Context Corp., the seminar kicks off on Sept. 30 in San Francisco. To find out more about this and other Network World seminars, call (800) 643-4668 or point your browser at www.nwfusion.com/seminars.



WorldCom adds to its 'Net riches

ANS and CompuServe Network Services become part of WorldCom family.

By Denise Pappalardo

WorldCom, Inc. struck again last week, snapping up ANS Communications and CompuServe Network Services (CNS) in a complex deal valued at more than \$1 billion.

WorldCom agreed to pay H&R Block, Inc. \$1.2 billion for CompuServe, Inc. and in turn, handed over the CompuServe consumer subscriber base and \$175 million to America Online, Inc. in exchange for AOL's ANS Internet access division. WorldCom, which has made more than 50 acquisitions in 10 years, is hanging on to CNS.

ANS, one of the first Internet service providers, brings WorldCom more than 400 new business customers, and ANS' InterLock managed firewall service is an offering UUNET lacked. CNS, CompuServe's data networking and systems integration company, brings with it 1,200 business customers.

The deal is the latest example of WorldCom building ISP market share and network integration capabilities via acquisitions. WorldCom previously gobbled up MFS Communications Company, Inc. and its UUNET Technologies subsidiary in a

high-profile deal. WorldCom already owned another ISP, GridNet International, Inc. With three big ISPs under its umbrella, WorldCom will be a giant among ISPs, with more than 2,500 points of presence.

ton-based consulting firm. "That's the only downside here," he added.

WorldCom still is working on integrating UUNET and MFS into its core business, with customers still hearing from an MFS representative one day and a WorldCom representative the next, Bartlett said.

WorldCom also needs to sort out several overlapping services, ranging from virtual private networks to Web hosting, said Eric Paulak, senior analyst at Gartner Group, Inc., a Stamford, Conn.-based consulting firm.

"WorldCom needs to come up with a successful service mix that will be based on who brings the best offer to the table," Paulak said. For example, if you compare ANS' remote access service to CompuServe's, you probably would choose CompuServe's and deal with migrating ANS' users to that service, he explained.

Customers inevitably will be disrupted in the wake of a deal of this size, but Paulak said WorldCom must be considerate of how customers will be affected. In the past, the company has been more focused on how integrating operations can save money, he said. ■

LET'S MAKE A DEAL

What WorldCom gets:

- ▶ ANS Communications and its 400 business customers
- ▶ CompuServe Network Services and its 1,200 users
- ▶ AOL's network service business for five years

What H&R Block gets:

- ▶ \$1.2 billion for selling CompuServe to WorldCom

What AOL gets:

- ▶ CompuServe Interactive Services and \$175 million from WorldCom
- ▶ 2.6 million new online subscribers

The question now is: How is WorldCom going to integrate all this stuff?

"The implementation of an integration plan is the most problematic piece of this deal," said Joe Bartlett, program manager at The Yankee Group, a Bos-

Sidgemore sizes up the deal



WorldCom last week spent more than \$1 billion to acquire another Internet service provider — ANS Communications — as well as CompuServe Network Services. What does the deal mean for UUNET Technologies, the large ISP already owned by WorldCom? To find out, *Network World* Senior Writer Denise Pappalardo last week spoke with UUNET CEO John Sidgemore.

Why does WorldCom need, or want, three ISPs: UUNET, GridNet and the soon-to-be-acquired ANS?

The Internet will continue to be our best opportunity in the communications industry. We can create and add more core strengths in our Internet business. The opportunity is still ripe to grow more quickly by acquisition. Two or three years down the road, the large embedded telephone companies might wake up and put the right amount of money behind Internet projects. We want to be there first.

How will WorldCom integrate ANS and CompuServe Network Services into its existing networks?

It's highly likely we will have separate organizations at certain levels and shared organizations at other levels. It's highly unlikely we will completely integrate ANS' modem pool with UUNET's modem pool. But we will probably integrate these networks at our backbone. A worldwide backbone offers economies of scale.

You mentioned during the press conference that CompuServe's network integration services are an asset that UUNET was simply missing before. How will UUNET take advantage of this asset?

UUNET today has an extranet product [in customer trials]. The problem is we don't have the arms and legs on the street to let customers know how this will work with their existing infrastructure. CompuServe grew up in an era where they were sitting down with large corporate customers to help them marry existing applications to their network. We know the technology. CompuServe will help us deliver it.



UUNET's CEO John Sidgemore



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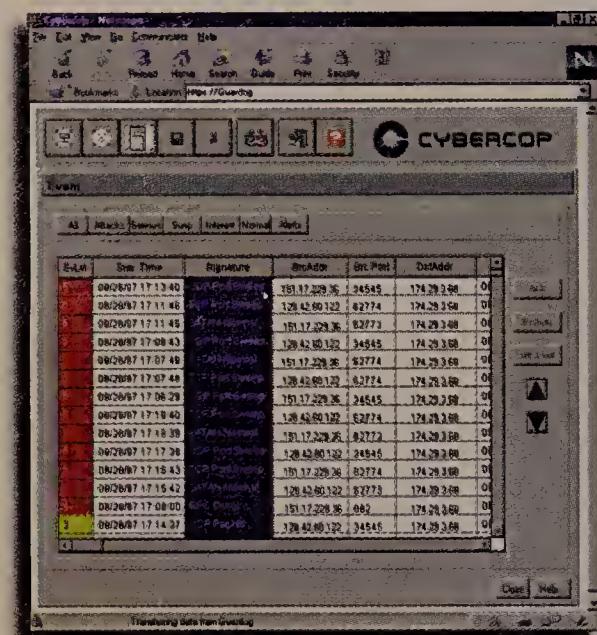
Network General putting CyberCop on network streets

By Ellen Messmer

Menlo Park, Calif.

Network General Corp., best known for its network protocol analyzers, this week will announce its foray into the security market with a product for monitoring network intrusions.

Expected to ship in December, the company's CyberCop offering consists of hardware-based sensors and software that run on any Web server.



Network General's CyberCop promises to monitor and detect network intrusions on intranets.

The sensors, which attach to LANs and sit behind the firewall, are designed to watch for out-of-the-ordinary events in network traffic. This enables the sensors to pick up the tracks of intranet intruders — whether they be employees or outside hackers. The sensors report on unusual activity to the CyberCop management server.

A spokesman for the Computer Security Institute noted there is a need for network equipment that performs "early warning and detection of malfeasance" because other measures, such as firewalls and encryption, are not silver bullets for all potential problems.

The CyberCop management server will cost about \$20,000, and the sensors will cost about \$15,000 each.

© Network General: (650) 473-2000

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.

This week's question:

What Silicon Valley router start-up recently received \$40 million in financing from the likes of 3Com, Nortel and Ericsson?

www.nwfusion.com

Browser bugs strike again

But Netscape and Microsoft say problems are overblown.

By Todd Wallack

Have you patched your browser lately?

Microsoft Corp. and Netscape Communications Corp. have confirmed security holes in their browsers in recent weeks, reminding users to make sure they have plugged the latest leaks.

When the sensors report suspicious activity to the CyberCop management server, the server can alert net managers through e-mail, pager or SNMP connection to a management console, Stoltz said.

Network General is joining a handful of vendors, such as WheelGroup, Inc. and Internet Security Systems, Inc., that sell net intrusion-detection equipment. Most products monitor operating systems or detect firewall breaches.

A spokesman for the Computer Security Institute noted there is a need for network equipment that performs

Netscape last week posted a fix to stop rogue Web site operators from intercepting data — including passwords, credit card numbers and other sensitive information — entered by end users.

And Microsoft found a bug in a beta version of Internet Explorer 4.0 that lets malicious Web site operators overwrite or corrupt files on a surfer's hard drive. Microsoft officials, however, said they doubt the problem will delay shipping the final version of the browser, slated for the end of this month.

But both companies claim no one actually has been victimized by the security holes. And Netscape denied the bugs are a sign

of rampant security problems in browsers.

"We've been getting a lot of questions about someone finding yet another bug in Navigator," said Netscape spokesman Christopher Hoover. "But it's not the quantity of bugs. It's the quantity of people using the software that keeps going up."

"There are now 65 million people using Navigator, and a lot of them are looking for bugs," Hoover said.

Microsoft said the latest bug is rooted in a beta version of DirectX, a set of multimedia APIs for game designers and other interactive software writers. DirectX allows programmers to access specialized hardware features without having to write hardware-specific code.

The DirectX breach could affect users running Preview 2 of Internet Explorer 4.0 for Windows 95 and NT or the beta version of the Java Software Development Kit 2.0. Both include the DirectX beta imple-

mentation.

Microsoft officials said they do not know of anyone who has exploited the bug, but recommend users disable Java when using the products, just in case. Detailed information on the workaround is available at the Microsoft Web site.

Meanwhile, Netscape said it plans to post a patch to an unrelated bug on its Web site today. The patch already is on Netscape's File Transfer Protocol server.

Using the Netscape bug, rogue Web operators could write a JavaScript program to open a second browser window and then read any information typed in the new window — including passwords, credit card numbers and other sensitive information.

The bug affects users running Netscape Communicator and Navigator 4.02. Netscape officials said they have confirmed the bug only in the Windows 32-bit platform, but have posted a fix for all platforms. ■

Hughes to bulk up its ATM wares

By Tim Greene

Germantown, Md.

There is a ton of ATM in Hughes Network Systems' future.

This week, Hughes is announcing that later this month it will ship a 3G bit/sec frame relay/ATM WAN switch called the CX5000.

In addition, Hughes has revealed plans for a 20G bit/sec ATM switch, the BX20000, that will compete in the same league as backbone offerings from Ascend Communications, Inc., Cisco Systems, Inc. and Newbridge Networks, Inc.

When it is available late next year, the BX20000 will feature a cell-switching module that also will fit into the CX5000 chassis, boosting the CX5000 cell-switching capacity to 7.5G bit/sec.

The dual nature of the switch is unique among other switches of its size from Cisco and Ascend, according to Liza Henderson, senior broadband analyst for TeleChoice, Inc., a consultancy in Verona, N.J. Ascend's 9000 and 500 and Cisco's IGX and BPX do frame relay or ATM, but not both, she said.

The CX5000 supports Ethernet and token-ring LANs, and frame relay and ATM backbone networks. It also supports SNA and X.25 traffic.

The switch features a dual frame relay/ATM switching fabric with 2.4G bit/sec dedicated to ATM and another 600M bit/sec reserved for frame relay.

That allows users to establish frame relay networks with the option to migrate to ATM as network needs change, according to Kumar Shah, Hughes' senior director of marketing.

One switch can support up to 280 frame relay ports, ranging in speed from 9.6K bit/sec to 4M bit/sec. It can support up to 16 ATM ports, at T-1, T-3 or OC-3 speeds, he said.

With switching power distributed among hardware modules, it can handle call setups for up to 100,000 frame relay switched virtual circuits per second, the company said. That same modular design allows for the addition of the company's next-generation ATM module, the CSM

II, which will be released with the BX20000 next year. Application Specific Integrated Circuits under development and other new technology account for the increase in speed over current ATM modules.

CSM II modules will come in eight-port OC-3 and two-port OC-12 versions. The BX20000 chassis can hold 14 modules.

CX5000 pricing starts at \$26,500. The two-port ATM module costs \$15,995. The four-port frame relay and two-port ATM modules cost \$15,995. LAN modules cost \$9,950 and come in two models: one with one Ethernet port and eight serial ports; the other with one Ethernet, one token-ring and four serial ports.

Pricing was unavailable for the BX20000 and CSM II. ■

FRAME POWER

Hughes Network Systems' CX5000:

- Includes a 3G bit/sec midplane
- Supports up to 4,200 DS-0 frame relay ports
- Costs \$100 per port
- Supports frame relay, ATM, IP and SNA

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Management trio tackles networked apps

Tivoli, Boole & Babbage and Optimal Networks enhance products, forge alliances.

By Jim Duffy

Three management vendors last week announced partnerships and product extensions to help users manage applications distributed throughout their networks.

As expected, Tivoli Systems, Inc. and Marimba, Inc. announced a reseller agreement and "strategic relationship" that

work with Tivoli to extend Tivoli's Application Management Specification to include definitions for software components for Internet and intranet applications.

These extensions will be based on the Open Software Description (OSD) specification. OSD provides a data format or vocabulary to describe software components, their versions, their underlying structure and their relationships to other components.

Boole also is bulking up its application management capabilities by adding management of Microsoft's Falcon middle-

ware to Command MQ. Command MQ was previously a manager of IBM's MQSeries middleware.

Command MQ agents running on Windows NT machines now can provide automated management for Falcon message-queuing middleware across the distributed enterprise, Boole said.

The agents provide local surveillance and diagnosis of Falcon operational problems and failures and send alerts to a central, Unix-based Command/Post console.

The Windows NT-based Command MQ agents will begin

shipping in October. Pricing starts at \$600.

Easing distributed application deployment is the focus of the partnership between Optimal and PeopleSoft.

PeopleSoft will use Application Expert, which runs on Windows-based workstations, to ensure successful large-scale deployments and to increase performance of its enterprise applications, Optimal said.

Application Expert monitors the performance of networked applications.

NationsBank Corp. is saving \$3 million annually by using Application Expert to assist in

Management Maneuvers

Tivoli

Announced an alliance with Marimba for software distribution over the Internet.

Boole & Babbage

Introduced Command MQ for Microsoft's MSMQ ("Falcon") message-oriented middleware.

Optimal Networks

Allied with PeopleSoft to speed deployment of PeopleSoft applications.

will allow companies to distribute and manage software beyond firewalls (NW, Aug. 4, page 1). Boole & Babbage, Inc. unveiled enhancements to its Command MQ management product that support Microsoft Corp.'s MSMQ — code-named Falcon — message-oriented middleware.

And Optimal Networks Corp. yesterday announced that human resources application developer PeopleSoft, Inc. will use Optimal's Application Expert to benchmark and deploy its applications for customers.

Under the Tivoli-Marimba arrangement, the companies plan to combine Marimba's Castanet with Tivoli's TME 10 Software Distribution and TME 10 Inventory application management packages. This will allow users to distribute software to Internet-connected users inside and outside firewalls. Castanet distributes software over the Internet.

"One of the problems we're seeing is that users are already feeling kind of overwhelmed by the need to manage applications in client/server systems, and the addition of Internet and intranets is making it even more complicated," said Alison Palmer, research analyst at Hurwitz Group, Inc. in Newton, Mass. "The partnership between these two companies is going to simplify that."

Tivoli will market, sell and support Castanet. Marimba will

the deployment of PeopleSoft applications, Optimal claimed. The company also claimed that users can cut a 100-hour deployment down to one hour using Application Expert.

© Tivoli: (512) 436-8000; Boole: (408) 526-3000; Optimal: (415) 845-6333

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Layer 3 Switching

3Com rolls out router replacement

By Jodi Daniels

Santa Clara, Calif.

If you are among the increasing number of network managers looking to replace slow and expensive routers with speedy and less costly switches, 3Com Corp. may have what you're looking for.

The vendor last week rolled out a Layer 3 switch, dubbed the CoreBuilder 3500, which boasts wire-speed switching and multi-protocol routing on every port.

Aside from positioning the switch as a router replacement, 3Com also expects customers to use it for aggregating switches and segmenting networks in workgroup environments.

The CoreBuilder 3500 will be on display at NetWorld+Interop 97 in Atlanta next month. Customers such as Aluminum Company of America, Inc. (ALCOA), which has a flat, Layer 2 network, are curious.

"New applications are rolling out that are causing an increase in broadcast traffic to a point where it's painful," said Avery Hancock, technical leader of information technology at the Pittsburgh-based aluminum sheet supplier.

"We want to start segmenting our network without having to go through a router," Hancock said.

Why not just use one of 3Com's existing Layer 3 boxes? One word: performance.

The switch maker's existing CoreBuilder 2500 and 6000 provide wire-speed Layer 2 switch-

ing, but not wire-speed routing. 3Com's new offering provides more than three times the routing performance of the older gear, with the existing products routing 1 million packet/sec and the CoreBuilder 3500 routing 3.6 million IP or IPX packet/sec.

3COM'S COREBUILDER 3500 LAYER 3 SWITCH



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- Supports quality-of-service bandwidth reservation

● Pricing starts at \$9,000

The CoreBuilder 3500 is a four-slot chassis that can support as many as 24 Fast Ethernet ports, four Gigabit Ethernet ports, 24 FDDI links, eight 155M bit/sec ATM ports or four 622M bit/sec ATM interfaces.

Typical configurations might be a chassis loaded with 24 ports of Fast Ethernet or a box with 18 Fast Ethernet ports and a Gigabit Ethernet uplink.

The switch can be managed by defining policies that prioritize traffic and reserve bandwidth for certain applications.

Such management options appeal to ALCOA's Hancock. "We'd like to provide different levels of service to users in separate production groups," he said. "So any process control

applications on the shop floor would take priority over some bozo with Netscape [Navigator] surfing the Internet."

3Com last week also offered a glimpse of other Layer 3 devices in its product pipeline. 3Com plans to announce — in the next couple months — the CoreBuilder 9000 chassis.

This device will offer high-port-density modules for Gigabit Ethernet and ATM and will provide Layer 2 and Layer 3 functionality.

In addition, customers can expect the 9000 to perform multiprotocol routing at 56 million packet/sec.

The CoreBuilder 3500 starts at \$9,000 and will ship in November. Pricing and availability information has not been set for the CoreBuilder 9000.

© 3Com: (408) 764-5000

CORRECTIONS

In our Sept. 8 Buyer's Guide, the price of HomeSite in the Net Results table should have read \$79 for downloaded software, \$89 for shrink-wrapped; and the price of HoTMetal Pro should have read \$99. In the product chart, the price of NetObjects Fusion should have been \$195.

All our agents are busy. We'll be with you shortly.
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NT directory debated

Developers ponder net effect of Active Directory Services.

By Christine Burns

Redmond, Wash.

Developers poised to collect a beta copy of Microsoft Corp.'s Windows NT 5.0 next week have raised concerns about the negative impact the new Active Directory Services (ADS) — a pivotal piece of the new release — will have on enterprise networks.

ADS is a hierarchical, global database that is supposed to replace the existing NT 4.0 domain structure as the central point for administering user accounts and network access rights.

Microsoft is expected to expand on the role of the directory by using it as the linchpin technology for tying together NT 5.0's laundry list of distributed services such as security, network, desktop and

application management.

But as developers wait anxiously to get their hands on official NT 5.0 beta code — which Microsoft has publicly stated it will hand out at its professional developers' conference in San Diego next week — they question how this everything-but-the-kitchen-sink approach to a directory service will adversely affect the operating system's scalability and performance.

Enzo Schiano, group product manager for NT at Microsoft, said internal stress tests on NT 5.0 show that ADS supporting 10 million objects could return queries from several different applications with extremely fast



Microsoft's Schiano says Active Directory can handle up to 10 million objects.

response times.

But developers said Microsoft has not yet done enough to ensure that synchronizing data stored on distributed ADS servers will not be a drain on the physical network.

"Nobody — including Microsoft — is really sure what kind of hit this amount of directory information will force on your network. There are just too many unknowns," said Eric Kitchen, vice president of research and development at FastLane Technologies, Inc., a manufacturer of directory management software based in Halifax, Nova Scotia.

Another Microsoft independent software vendor who has tested early access code warned, "People are going to have to think in terms of much higher bandwidth if they want to use Active Directory on an enterprise scale."

Directory ties

While corporate networks have adequately supported directory services for years, Microsoft's moves to cram everything possible into ADS is potentially the biggest implementation issue, developers said.

"Every time you make any changes on the PC, it has to get reflected in the [ADS] global database. This means more traffic going on the network than ever before," said another Microsoft developer who has tested prebeta code of the ADS, which runs on existing NT 4.0 boxes.

Topping the list of information to be stored in that ADS is all security data concerning users and the network resources accessible to them. The directory will contain all public- and private-key user authentication data and will have the ability to store X.509 security certificates.

NT 5.0 will ship with enhanced Dynamic Host Configuration Protocol and dynamic Domain Name System services that use ADS to track all IP

addresses and DNS server name updates. And finally, all applications that conform to Microsoft's Distributed Component Object Model specification will employ the NT 5.0 directory as the repository for object definitions and locations.

Microsoft officials said they have added features to ADS that will allow it to accommodate this growing amount of information.

Bob Kelly, a Microsoft product manager, said NT 5.0 will give an administrator granular control over how much directory information gets synchronized between servers over the network, as well as the ability to partition the directory for use at remote sites.

Partitioning allows a company to take a segment of the directory and make it available to only the location that needs direct access to that information. This reduces the amount of directory synchronization that must occur over wide-area links. ■

Router

Continued from page 1

of users' networks as they move forward is very positive."

What about SecureFast?

The flip side is that Cabletron

has spent lots of time and money championing its SecureFast strategy, which preaches flattening out the network using the company's "route one, switch many" scheme. In fact, Cabletron next year is planning to enhance SecureFast to support "packet-by-packet" Layer 3

switching, which is a more scalable approach. But SecureFast switches — based on Cabletron's proprietary routing protocol — are quite different from YAGO's full-blown router offering.

The YAGO box is a fast router that speaks traditional routing protocols such as Open Shortest Path First and Border Gateway Protocol 4.

So the biggest issue — if Cabletron moves forward with the YAGO deal via an OEM agreement or possibly a straight acquisition — will be how this new gigabit switching router fits into the SecureFast scheme, industry observers said.

MacAskill anticipates that Cabletron will offer a two-pronged strategy.

"Cabletron can go in heavy with SecureFast for those clients that like the idea of flattening out the network and using its virtual routing services, and [Cabletron] can play the Layer 3 game for router-centric clients," he said.

Analysts speculated that Cabletron's Spectrum net management platform would play a role in linking the different technologies.

Getting to know YAGO

The YAGO technology is a hardware-based switching router capable of switching traffic — at Layer 2, 3 and 4 — at gigabit rates on all ports.

tion a different policy than a database application.

Piece of the puzzle

But the YAGO device would be just one piece of Cabletron's switch puzzle. Also at Interop, Cabletron will unveil a suite of

Gigabit Ethernet switching products, including adapter cards and switch modules for the company's MMAC-Plus backbone chassis, Smart-Switch 6000 wiring closet switch and SmartSwitch 2000 workgroup device.

In addition, Cabletron will announce that its existing MMAC-Plus two-port Gigabit Ethernet switch module now adheres to the existing Gigabit Ethernet prestandard.

But there is no doubt that the gigabit switching router would be a key weapon in Cabletron's arsenal.

A Cabletron-YAGO partnership would be yet another example of the big internetwork vendors lining up with Layer 3 players to go after giant Cisco Systems, Inc. Recently, Bay Networks, Inc. acquired Rapid City Communications, Inc., and rumors are swirling that 3Com Corp. is working with Extreme Networks, Inc.

© Cabletron: (603) 332-9400; YAGO: (408) 774-2900

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Alteon leads the way to Layer 4

While most vendors are talking about Layer 2 and 3 switches, some start-ups are raising the bar to Layer 4. Alteon Networks, Inc. this week will announce Layer 4 switching support for its ACEswitch family of Gigabit Ethernet products, *Network World* has learned. Separately, start-up YAGO Systems, Inc. — which has a partnership with Cabletron Systems, Inc. — is bragging about the Layer 4 switch capabilities it is developing.

Layer 4 switching uses TCP session-related information in HTTP or File Transfer Protocol to make intelligent switching decisions, a technique that industry observers said allows users to better manage, control and prioritize traffic by application type. That is different from basic Layer 2 switches, which transfer data between ports based on the destination address of individual packets, as well as Layer 3 switches, which perform routing functions at wire speed.

Alteon, which has homed in on the server-switch market, will use Layer 4 switching to allow customers to scale their application and server capacity, sources said. Customers will be able to have multiple servers support a specific application and balance that server traffic across those boxes to ensure that available server capacity is being used efficiently.

As for setting different priority levels, net managers might assign interactive applications such as HTTP a higher priority than bulk file transfers.

Alteon's Layer 4 switching capability will be available by year-end as a \$3,000 software upgrade for the ACEswitch 110 and 160.

For more information, contact Alteon at (408) 574-5500.

—Jodi Daniels

PROFILE: YAGO SYSTEMS, INC.

Based: Sunnyvale, Calif.

Founded: September 1996

Key product: Gigabit switching router

Development team: Folks from Cisco, Intel and Sun

Fun fact: The company's name "YAGO" stands for Yet Another Gigabit Operation.

by switching Layer 4 (transport layer) application flows. This allows the device to make switch decisions based on the applications a business is using.

Most protocols such as HTTP, File Transfer Protocol and Simple Mail Transfer Protocol — which are used in certain applications — have a unique "socket number" at Layer 4 that the YAGO device will be able to identify and use to provide greater application-specific policy control.

For example, a net manager looking at a Layer 3 flow can only control one computer talking to another computer, irrespective of what applications he is using. But by going to a Layer 4 — or socket-based — flow, a net manager can assign an e-mail applica-

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Developers remain committed to Java

But concerns about write-once, run-anywhere performance and product delays linger.

By Chris Nerney

Chicago

David Kirsh is part of a team at Lucent Technologies, Inc.'s BellLabs division using Java to build a client interface that can work in a variety of upcoming internal projects.

And though Kirsh said Lucent "is definitely committed to Java" — the company has been using the Sun Microsystems, Inc. programming language in its corporate intranet for more than a year — he is not talking about worry-free commitment.

"We're suffering angst over whether we're doing the right thing," he said. "We have the same questions everyone else has: Will 'write once, run anywhere' be a reality? Is Microsoft Corp. going to take over the world anyway?"

The tone of Kirsh's comments were consistent with those of many others at the SIGS Conference for Java Development held here last week. The four-day gathering featured technical workshops for Java developers on programming tips, migration strategies and application development.

Nearly all of the 500 or so attendees are hard-core believers in Java as a programming language and as a cross-platform emancipator. But some of the faithful admit to being tested by Java performance woes, product delays and by what

many call a campaign of "fear, uncertainty and doubt" on the part of Microsoft, which sees cross-platform Java as a threat to its Windows desktop hegemony.

"We're probably not going to support Java quickly," said Marina Arseniev, a programmer at the University of California at Irvine (UCI), who is coordinating a project that eventually could bring Java to thousands of desktops across campus.

Though a strong proponent of Java's write-once, run-anywhere promise, Arseniev ticked off a litany of Java woes — including browser incompatibilities, software bugs and the battle between Sun and Microsoft over class libraries — to explain her qualms about selling UCI administrators on Java.

"UCI has a large investment to make, and it's my neck on the line," she said. "How can I tell them to spend money on something that doesn't even run with Netscape browsers on a Macintosh?"

Microsoft officials, of course, are quick to exploit and exacerbate such concerns. In his keynote speech last Monday, Cornelius Willis, Microsoft's director of platform marketing, said, "the Java language delivers in spades. The platform doesn't."

"Java is a great language for building Windows 32 applications," Willis said. "But 'write once, run everywhere' is basically a farce."

Many developers, even those who acknowledge current problems with Java, remain steadfast in their support.

"We are absolutely committed to Java," said Dan Price, a systems engineer at GTE Data Services. His company has "been using Java increasingly in the last year and a half, though it's not the only thing we use by any means," he said.

"I'm not worried about Microsoft," he

said, accusing the software giant of spreading misinformation about Java's cross-platform ability and Microsoft's own support of Java.

However, Arseniev said Sun and Microsoft need to work together on foundation classes — software tool sets for creating the look and feel of Java in applications — if Java is to mature.

And she blamed an "anti-Microsoft" culture among software engineers for fueling needless antagonism.

"Microsoft-bashing is as unprofessional as stealing a great technology and subverting it," she said. ■

Rivals urge Sun to hand over Java

Microsoft Corp., Compaq Computer Corp., Digital Equipment Corp. and Intel Corp. last week sent Sun Microsystems, Inc. a letter asking the company to turn over ownership of its Java development language to an international standards body.

The letter, addressed to Sun Vice President Jim Mitchell, comes as the company is preparing to resubmit a proposal to the International Standards Organization, under which Java would become an ISO-sanctioned standard.

Under Sun's plan, however, the company would keep control of the Java trademark and over revisions to the standard, an objective opposed by many in the industry.

Following a vote on Sun's original proposal in July, Sun had 60 days to address concerns raised by ISO members.

In the letter sent last week, executives of the four companies urged Sun to turn ownership of Java over to ISO or another international standards body, which then should handle maintenance and evolution of Java along with control of the specification. In addition, the letter states that the name Java should be associated with the standard, and implementers meeting conformance to the standard should be free to use the name.

Sun's Mitchell could not be reached for comment.

— Torsten Busse, IDG News Service

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Briefs

■ **Intel Corp.** last week unveiled a **Fast Ethernet adapter** that delivers a 30% performance improvement over the company's existing card. The single-chip EtherExpress PRO/100 adapter supports the Desktop Management Interface 2.0 and provides adapter fault tolerance for servers.



A second adapter in the EtherExpress PRO/100 family delivers the same capabilities and enables remote PC or server "wake-up" for after-hours management. The new cards — designed for PCs and low-end servers — will go up against offerings from top competitor 3Com Corp., said Reinier Twining, business unit manager at Intel.

The first adapter is available now for \$84. The management-enabled adapter will ship by year-end; pricing has not been set.

© Intel: (800) 538-3373

■ **Microsoft Corp.** has released beta code for a small-business rendition of its Windows NT-based BackOffice server suite. **BackOffice Small Business Server** is geared toward companies with fewer than 25 PCs. It offers a simplified five-step setup process for integrated file, print, fax, modem-sharing and database services. The package also includes a Web server, e-mail services, Web authoring tools and Internet wizard programs that simplify 'Net access.

BackOffice Small Business Server will be generally available this fall. Pricing has not been determined, but the company said it will cost less than its full-fledged BackOffice suite, which costs \$2,400.

Multilayer Switching

Start-up dives into crowded Layer 3 switch pool

By Jodi Daniels
San Jose, Calif.

FlowWise Networks, Inc. last week announced that it wants a piece of the Layer 3 switch market. But the start-up is not alone.

It will need to fight off Bay Networks, Inc., Extreme Networks, Inc. and Foundry Net-

other Layer 3 switch vendors' boxes, they're not quite there," he said.

The TMS 1600 is a stand-alone switch with two option slots, which can house an eight-port autosensing 10M/100M bit/sec Ethernet module or a one-port Gigabit Ethernet card.

Customers can use the device to off-load the routing of IP packets from their existing backbone router, leaving the router with more processing power for other protocols and increasing the network's IP routing throughput to about 3 million packet/sec, according to Nasr.

The TMS 1600 supports standards-based routing protocols, including Routing Information Protocol and Open Shortest Path First, and the IEEE 802.1d Spanning Tree Protocol for Layer 2 switching.

QoS features

Another highlight of the FlowWise box is its quality-of-service (QoS) capabilities. The switch features software that provides address-based and policy-based QoS and will offer Layer 3 QoS based on the IETF's Resource Reservation Protocol.

FlowWise plans to move beyond its 10M/100M/1,000M bit/sec Ethernet focus to offer FDDI, ATM and T-1 interface support in 1998.

TMS 1600 can be managed via SNMP on SunNet Manager and HP OpenView platforms. The company also is offering a Java-based Web management tool for Solaris and Windows 95 workstations.

Get more info online:

- A detailed discussion of the definition of a switch
- Background Info and primers on Gigabit Ethernet
- A Gigabit Ethernet product catalog by vendor and device

www.nwfusion.com



The TMS 1600 costs less than \$10,000 for a 16-port Fast Ethernet configuration, or about \$625 per port. Gigabit Ethernet

uplinks are expected to cost \$2,500 per port. The switch will ship by year-end.

© FlowWise: (408) 474-0385

Olicom fires up new switches

Company introduces CrossFire token-ring, ATM devices.

By Jodi Daniels
Dallas

Good news for token-ring customers? Now that's a switch.

Or in this case, two new switches from Olicom, Inc., which last week rolled out separate token-ring and ATM devices designed to help customers beat the bandwidth crunch.

The token-ring offering, dubbed the OC-8600 CrossFire switch, features as many as 28 token-ring ports and can be stacked up to eight units high to support as many as 224 ports.

The device boasts an aggregate switching rate of 1.6M packet/sec and latency of 23 microsec, which amounts to a threefold to fourfold performance improvement over existing gear, according to industry observers.

offers no ATM support and costs \$650 per port.

Using the ATM uplinks on the OC-8600 box, token-ring customers can feed into a larger ATM switch for backbone or server connections. And for that, Olicom has just the thing: its OC-9100 CrossFire ATM switch.

The four-slot chassis can support as many as 16 155M bit/sec ATM ports and up to three 622M bit/sec ATM interfaces. The switch supports LAN Emulation (LANE) as well as key traffic management features such as available bit rate (ABR).

The new switch is a big improvement over Olicom's existing ATM device, which does not offer 622M bit/sec ATM links, LANE or ABR support and is priced at about \$1,500 per port.

The OC-9100 will cost about

OLICOM'S CROSSFIRE TOKEN-RING SWITCH



- Supports as many as 28 token-ring ports
- Can be stacked up to eight units high
- Offers full-duplex support on every port
- Supports all four token-ring bridging modes
- Offers two 155M bit/sec ATM uplinks
- Priced at \$399 per port

But the real highlight of the OC-8600 is its price. The box, which will ship next month, costs about \$399 per port. Analysts said most token-ring switches range from \$650 to \$2,200 per port.

Other key features include support for full-duplex 32M bit/sec links for server connections as well as 155M bit/sec ATM backbone uplinks.

The OC-8600 will replace an existing Olicom switch that supports only eight token-ring ports,

\$1,200 per port in a 16-port 155M bit/sec ATM configuration. The switch will be available next month.

Olicom last week also offered a glimpse of what to expect from the company in the coming year. Key projects on its plate include Layer 3 switching for non-ATM networks; Multi-Protocol over ATM support; Fast Ethernet switching; and higher density modules for its chassis-based switch.

© Olicom: (413) 773-5300



Electronic software distribution is coming of age

Receiving software updates electronically has been discussed for years as a potential alternative to purchasing

shrink-wrapped floppy diskettes or CDs. But only now is electronic software distribution (ESD) technology getting to the

point at which it works across hardware and software platforms, allowing vendors to develop ESD strategies.



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For example, Microsoft has set up an ESD group within its end-user unit. The company also has joined with rival push technology vendor Marimba to standardize the Open Software Description, which is designed to ensure that ESD will work regardless of a customer's client and server software environment.

It's also the right time for ESD, judging from the evolution of software distribution over the past 10 years. I remember NetWare 2.15 arriving with 23 diskettes and 10 softbound manuals. But over time, 5 1/4-inch floppies gave way to 3 1/2-inch high-density floppies and then CDs. During this time, printed manuals practically have disappeared. Today, you're lucky to get a 3 x 5 card with instructions on how to insert a CD into the drive. ESD removes the last vestiges of paper and other packaging.



Dave Kearns

The promise to you, the purchaser, is that ESD will make your job easier. No more running from desk to desk to install software. No more running software inventory applications to check the version level everyone has, then running from desk to desk upgrading the laggards. Patches and updates will come to you as they're released. New products and new releases of old products will be available in "try before you buy" evaluation versions. And manuals will be available as HTML documents so corrections can be made page by page and automatically sent to you.

The only major downside is the same one we always seem to have with new software: a lack of resources.

You thought you had the bandwidth shortage licked when you installed a 100M bit/sec backbone and switched 10M bit/sec pipes to the desktop. But those links are going to fill up fast if all your software vendors start pushing patches, fixes and updates to all of your registered end users.

While you could bulk up or add a couple of servers as staging areas to receive the software from the vendor, and then push the software out to the end users, that only saves bandwidth on your Internet connection, not your desktop connections.

ESD should be in full flower within two years, so you should start planning now. In next week's column, I'll recommend the steps you should take to prepare for ESD.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Many of Norton Anti-Virus for NetWare users got a nasty surprise when installing the August virus definitions: lost network connection messages. Turns out the problem is in the NAV.NLM. If your version is earlier than 2.05, call Symantec at (541) 465-8420.



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Briefs

Advanced Computer Communications, Inc. last week introduced *Tigris POP*, a **remote access concentrator** with four primary rate ISDN ports, dual 10/100 Ethernet ports and two slots for 48- or 62-port modem cards. *Tigris POP* allows dial-up access to a central site by analog modems at up to 56K bit/sec or ISDN. It can support priority levels based on caller, including guaranteed access for designated users. *Fast Path Queuing* routes traffic to specific links, supporting further priority treatment of selected traffic.

Tigris POP is available this month for about \$31,200. A European version also is available.

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Hewlett-Packard Co. announced that **Silicon Graphics, Inc.** and **Stratus Computer, Inc.** have joined HP OpenView-Ready Program.

OpenView-Ready is an HP program to bundle stripped-down versions of the company's OpenView network and systems management platform with servers. Stratus and Silicon Graphics will package preconfigured versions of HP's IT/Operations systems management software with their Unix servers.

The companies did not disclose a time frame for shipping OpenView-Ready servers.

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Platinum Technology, Inc. said nine of its point management products will now be integrated into a suite called **ProVision**. Applications for system, network and database performance management, job scheduling, security, help desk and software distribution make up the ProVision line. ProVision applications can be purchased separately or as a bundle, but pricing for the bundle will be the same as if all nine applications were purchased individually. ProVision will run on Windows NT and Unix systems and be available at year-end or in early 1998.

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IBM to increase server options with new communications software

Series of announcements includes new Host-on-Demand and SNA emulation packages.

By Marc Songini

IBM last week announced a family of software packages aimed at helping users increase the speed and connectivity options in their large networks.

The company rolled out new and enhanced versions of its eNetwork Communications Servers and improved Web-to-host connectivity via a new release of its Host-on-Demand package.

The new eNetwork Software packages are part of IBM's attempt to revamp its

existing Communications Server and Personal Communications client offerings into more integrated, multiprotocol, multipurpose packages.

eNetwork packages include a TCP/IP stack, IBM's Personal Communications 3270/5250 host emulator, Lotus Develop-

ment Corp.'s Notes Mail client and a Netscape Communications Corp. Navigator Web browser.

IBM introduced eNetwork Communications Server for OS/390 and OS/2. Key to the OS/390 package is a new TCP/IP stack that IBM said will increase throughput fourfold over today's TCP/IP for MVS package.

IBM's eNETWORK SOFTWARE PRODUCTS
Features include:

- New networking options via eNetwork Communications Server package for OS/2 and OS/390
- New high-performance TCP/IP connectivity for the S/390 server
- Easier access to host resources via Host-on-Demand Version 2

In the OS/2 package, IBM added support for its new Branch Extender technology, which lets users build larger interconnected Advanced Peer-to-Peer Networking-based nets.

It also improves throughput in APPN nets via support for IBM's High Performance

Routing protocol.

For the Windows server world, IBM rolled out an enhanced version of eNetwork Server for Windows NT. Key enhancements include support for Novell, Inc. IPX/SPX-based clients and new data-compression support.

IBM also enhanced its line of PC-to-host connectivity wares. For example, its Personal Communications for Windows 95 and Windows NT, Version 4.2, now includes technology that lets users run SNA over an IP network.

The package now also supports Unix host via VT-52, VT-100 and VT-220 emulation support.

For improved Web-to-host access, IBM rolled out Version 2.0 of Host-on-Demand, a Java program that allows users to access mainframe-based SNA data via a Web browser.

Version 2.0 adds support for tn5250, VT-100 and VT-220 so those users can access AS/400 and ASCII host-based applications over the World Wide Web.

A new CICS gateway improves access to CICS applications on the mainframe.

"The new Host-on-Demand product is hitting the market at the right time," said Cindy Borovick, program manager at International Data Corp., a Framingham, Mass.-based market research firm. "IBM is in a position to make the mainframe more competitive in intranets."

IBM said this round of announcements had loftier goals.

"We're extending the reach of the enterprise," said William Duncan, business manager of development and strategy for IBM's Networking Software Products division.

"The goals are fourfold: deliver enterprise-class dependency; provide end-to-end access, easy implementation and configuration; and more effective utilization of the network."

One IS manager testing the Communications Server for OS/2 and NT and the Personal Communications for Windows 95 and NT had high praise for the products.

"There are a lot of capabilities built into them," said Toby Pennycuff, vice president of technology services at Texas Commerce Bank, based in Houston. The OS/2 package "lets you run pure SNA over IP," he said. ■

RAD loads lots of voice on a T-1

By Tim Greene

RAD Communications, Inc. this week will make it easier to expand the capacity of private voice networks without adding to the monthly cost of T-1 circuits.

Using a new voice compression card, the Multiphase Maximum Likelihood Quantization (MPMLQ) Voice Card, RAD's T-1 Integrating Multiplexer System now can boost the number of voice calls a T-1 handles from 24 to 288.

The system calls for feeding PBX traffic into 12 stacked RAD Kilomuxes and concentrating their output in a RAD Megaplex mux. The Megaplex feeds the T-1 link.

To accommodate the 288 calls per T-1, each Kilomux must be

populated with fully MPMLQ Voice Cards.

Mike Broderick, network manager for stereo retail chain New England Audio, Inc., said he has used each successive generation of RAD voice compression card in his 48-store network.

With compression, he can increase the number of voice channels to each store without increasing the bandwidth of the dedicated lines that tie them to headquarters. The new card will support each store with three voice channels plus data over a single 56K bit/sec dedicated line, he said.

He said the compression algorithm used in the new MPMLQ card is a noticeable improvement

over Code Excited Linear Prediction (CELP), the algorithm used in previous RAD cards.

With MPMLQ he gets a better quality signal than he did with CELP using three times the bandwidth, Broderick said.

RAD acknowledges that the voice quality from the latest card does vary depending on the compression rate. The maximum number of toll-quality voice channels the T-1 Integrating Multiplexer System can handle is 220, the company said.

Broderick said that conserving bandwidth allows the stores to send more real-time data over the same WAN lines.

Designed for use on more expensive long-

haul or international T-1 links, the entire T-1 Integrating Multiplexer System can pay for itself in less than six months, RAD said.

The T-1 Integrating Multiplexer System can be managed with an HP OpenView platform, other PC-based SNMP platforms or via an ASCII terminal. It is available now.

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- Offers better voice quality over less bandwidth.
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Doing the performance two-step

Whether the topic is business management or switch performance, deploying a centralized vs. distributed model is part of the discussion—and usu-

ally a point of contention. While I won't offer my opinion on the former, I have collected some interesting data on the latter.

Judging from data collected over the

past year, it appears that in the realm of internetworking devices, a distributed architecture almost always is deployed in the boxes that perform best.

For starters, let's look at some raw Layer 2 and Layer 3 switching/routing numbers.

What is notable is that all four of the boxes involved in this game of perfor-

mance leapfrog have been based on distributed processing models. Herewith the data: (Note: Test results can be found on The Tolly Group Web site at www.tolly.com. Document numbers are given for quick lookup.)

Madge Networks started things off last December when it brought in its LAN-switch 3LS. In half-duplex testing of four Fast Ethernet ports and 16 Ethernet ports, they turned in wire-speed performance, simultaneously routing IP and IPX as well as switching six traffic streams. Aggregate system throughput for this Application Specific Integrated Circuit-based system cracked the 400,000 frame/sec mark (Doc: 7250).

In April, 3Com made a major leap forward in Layer 2 switching performance. The company's CoreBuilder 5000 outfitted with 68 ports of Fast Ethernet cranked through more than 5 million frame/sec, handling 34 traffic streams (Doc: 7277).

Just a month later, the Rapid City (now Bay Networks) First f1200 delivered more than 7 million packet/sec of Layer 3 switching in a configuration of some 60 full-duplex Fast Ethernet ports (Doc: 7278). And in July, the Plainview Wave-Switch 9200 topped 19 million frame/sec in Layer 2 switching when running 128 ports of full-duplex Fast Ethernet (Doc: 7287).

Understanding distributed platforms is not always as easy as it might appear from the previous examples. A case in point is testing we recently performed on Ascend and Cisco routers.

In the first round, commissioned by Ascend, the GRF 1600 scaled linearly up to nearly 1 million packet/sec when routing 16 streams (32 ports) of Fast Ethernet (Doc: 7286). The Cisco 7513 aggregate system throughput peaked at somewhat less than 400,000 packet/sec when the router was handling just three streams of data.

What might appear strange is that Cisco outfitted its 7513 not only with the new Route Switch Processor-4, but also with the Versatile Interface Processor-2-40—the “distributed” processing component.

Unfortunately, the generally available software used for the test could not take advantage of the advanced hardware. But the story doesn't end there. In soon-to-be-published single-product tests commissioned by Cisco (Doc: 7295), the 7513 shows what it can do when Distributed Switching software is employed on the router.

You'll have to wait a few weeks for the details, but to say the improvement is dramatic is not an exaggeration.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

Directed and presented by Tom Jenkins, TeleChoice, Inc.

1997 Seminar Tour

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10. Analyze case studies of various network types to see how frame relay can be best implemented
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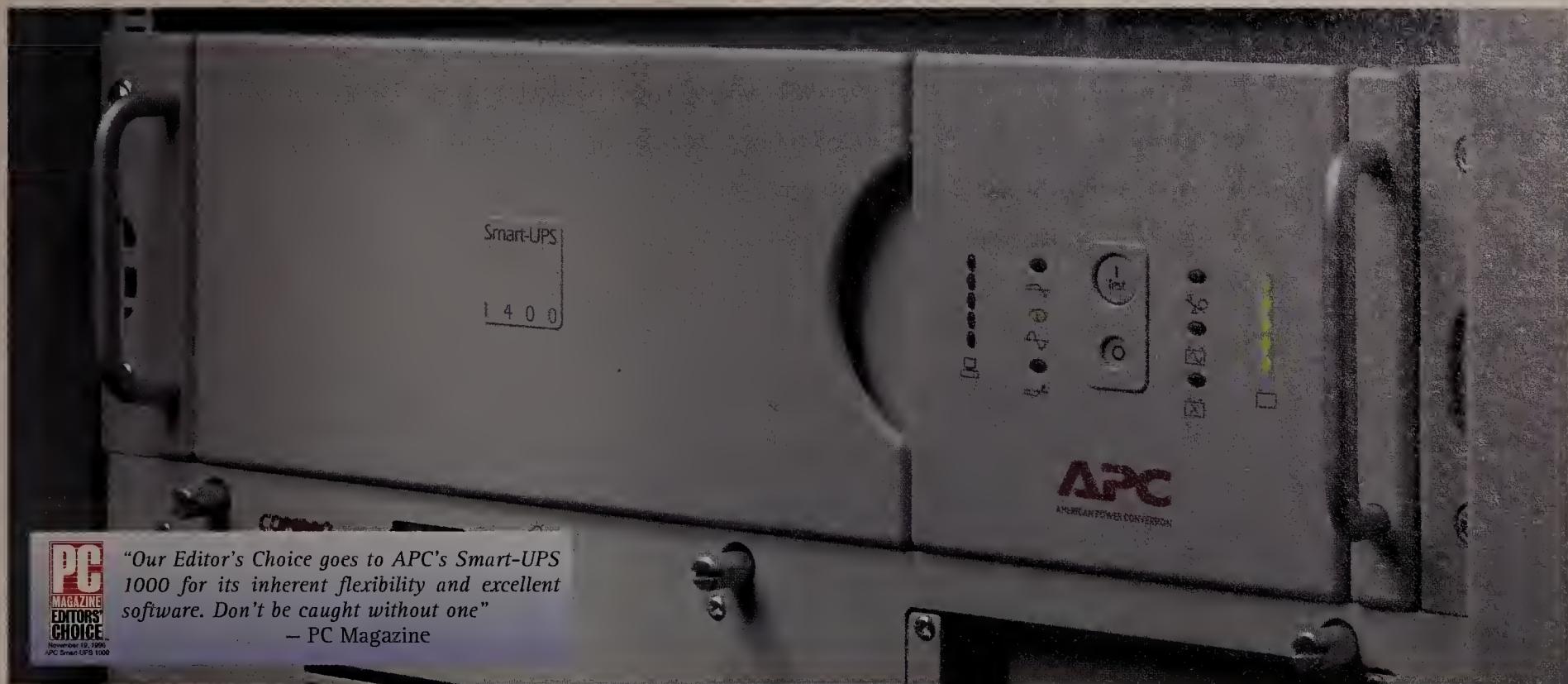
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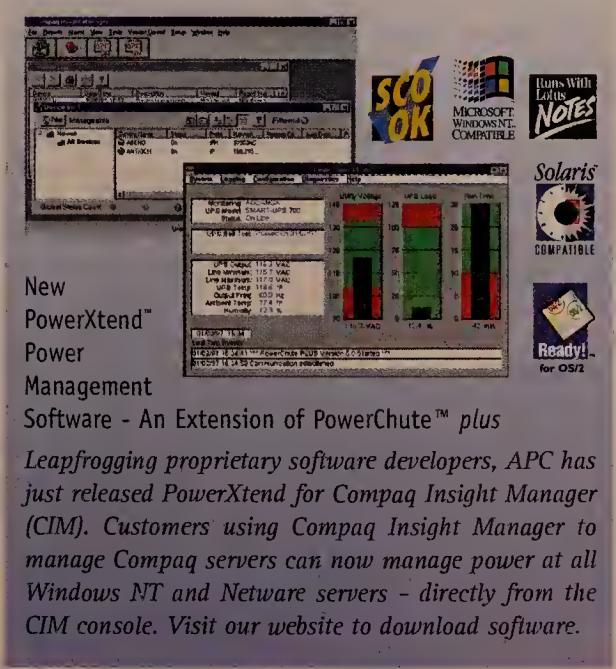
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Saying goodbye to TDM

When TDM no longer measures up



With the ever-increasing need for building better meshed networks and supporting applications requiring high bandwidth, the traditional network based on leased-line time-division multiplexing (TDM) just isn't cutting it anymore.

TDM-based networks worked well when SNA ruled the land, but that's not the case with most new multiprotocol nets. But eliminating the TDM net isn't what most users are doing; many are including it as a security blanket while they move to more advanced and flexible technologies such as ATM or frame relay.

Users beginning the transition from TDM report that careful planning and execution are required so you can reap the benefits of those technologies without getting whacked by unforeseen problems and expenses.

"ATM lets us migrate our legacy traffic and diversify our network architecture," says Greg Britz, systems integration engineer for Burlington Northern Sante Fe Railroad in Kansas City.

The company is shifting from a TDM network anchored by DS-3 trunks to one powered by General DataComm, Inc. ATM switches. The existing 45M bit/sec DS-3 TDM network stays in place for narrowband applications, while the ATM network handles some of that legacy traffic, including voice, and leaves room for more.

"The ATM network allows us to be ready for the next move, which is broadband networking in a collaborative environment and video," Britz says.

General DataComm ATM switches allow network bandwidth to be used flexibly by supporting different qualities of service. Combined with priority queuing, the switches offer more efficient use of bandwidth than their TDM predecessors. For example, if top-priority voice trunks are not being used, data traffic can be sent over that bandwidth. In a TDM network, that bandwidth would be off-limits to other applications, idle or not.

That flexibility allows Britz to wring extra bandwidth out of his DS-3 ATM trunks. "With ATM, you can overbook a DS-3," Britz says.

By leaving the existing TDM infrastructure in place, the railroad can make a gradual, manageable transition. Some legacy traffic runs on the ATM net and some on the old TDM net. The two talk over OC-3 connections from legacy routers to the ATM switches. If the entire ATM network were to fail, the TDM network could keep the essential traffic moving. And the backup would work in reverse should the TDM net fail.

"Building ATM on top really bulletproofs our network," Britz says.

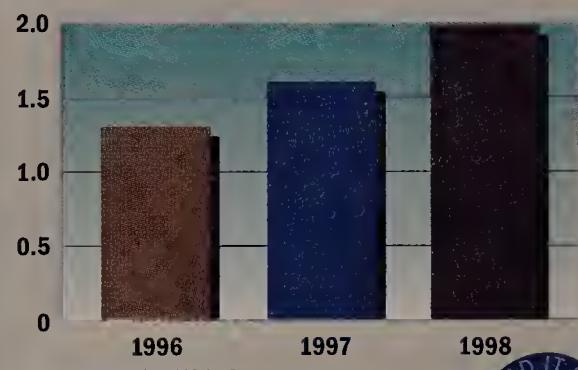
Maybe frame relay

Many of the existing T-1 networks out there, with their always available, dedicated bandwidth, were

By Tim Greene

DEMAND IS INCREASING FOR T-1 LINES

U.S. T-1 market (in millions of installed local exchange carrier lines)

**Get more online:**

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set up to support temperamental SNA traffic that just won't tolerate delay. But other technologies, frame relay in particular, have learned to coddle it.

Gregg Foley, the senior network analyst for the Cherry Creek School District #5, of Englewood, Colo., is in the midst of a transition from TDM dedicated lines to frame relay.

While the district still keeps some dedicated trunks just for SNA, Foley also has installed an SNA gateway from Novell, Inc.

The gateway encapsulates the rest of the mainframe traffic in IPX packets for transport across the frame relay WAN. With the gateway spoofing the mainframe to keep sessions alive, users don't know the difference, he says.

One SNA link did run into trouble because of a problem that the frame relay provider, US WEST, Inc., blamed on a router in the school district's network, but that glitch was eventually resolved.

The back and forth to correct the problem, though, has led the district to invest in ADC Kentrox DSUs/CSUs that include network monitoring probes known as FrameVision. That helps Foley isolate whether link problems are in his gear or in the carrier's network, he says.

In addition, it gives him a more detailed read on actual traffic patterns, which lets him fine-tune the amount of bandwidth he buys. "It gives me capacity planning," Foley says. With proper bandwidth allocated for each WAN link, he can keep traffic moving.

While other technologies might hold some attraction, it is not necessary to swap out your current TDM network in order to make changes, according to U.S. Air Force Maj. Harry Opel, branch chief of information infrastructure engineering for the Headquarters Air Combat Command in Langley, Va.

The command is still using Network Equipment Technologies, Inc. IDNX chassis he bought in 1991 to support TDM. "The chassis is the same, but we are running frame relay and ISDN in addition to traditional TDM," he says. And he's looking forward to the ATM card expected to ship this month.

The common chassis leaves him with a core of gear that's constant, a big help for an IS department that suffers a 60%-per-year turnover in personnel.

"Feature cards are very easy for me to accommodate as opposed to a brand-new box," he says.

The government is constantly watching his expenses, so he has to make sure he can justify the technology changes he makes — a good lesson for anyone. "The onus is on me as a user to do the homework and point out the most reasonable solution," he says.

Still a dedicated market

Despite incursions being made by packet and cell technology, the demand for dedicated T-1 lines continues to grow (see graphic).

And prices have been dropping, in part prompted by newer, less expensive technology that supports T-1 service with a smaller investment in equipment. The next generation of alternative technology, known as HDSL2, will allow provisioning T-1 service over two wires instead of the current four — another cost savings.

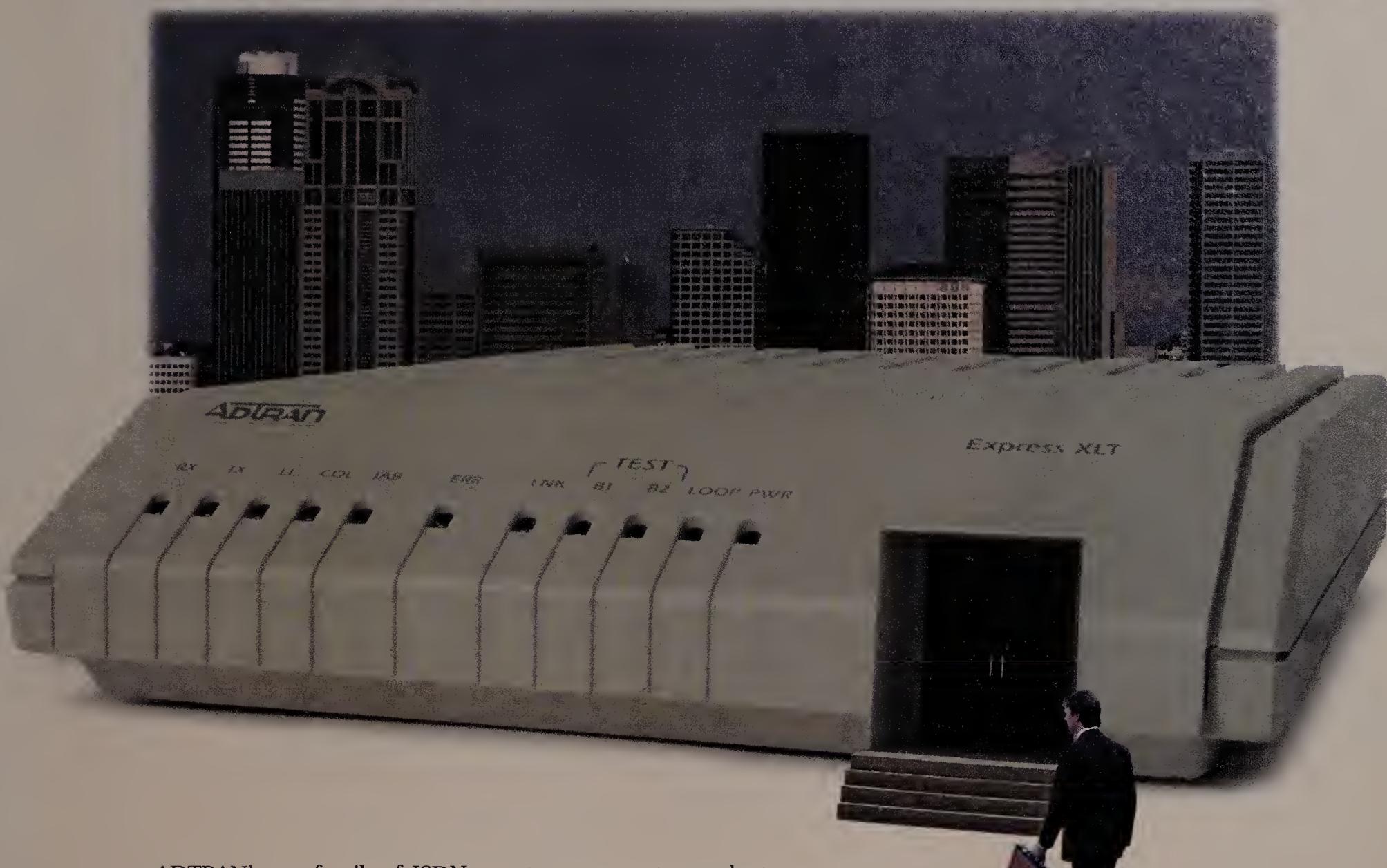
While the number of dedicated T-1 lines in service grows, that does not mean TDM is still enjoying boom times, according to Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

"Only about 5% of new T-1s are genuinely muxed," he says. The rest support corporate Internet access, voice trunks terminating at PBXs or point-to-point data lines terminating in DSUs/CSUs or routers.

Abandoning TDM for other technologies can make sense for several reasons, he says. First, the cost of a full DS-3 or even a fractional DS-3 may be too high, given that the user may not need the full 45M bit/sec a DS-3 offers. DS-3s also are not available in some locations (NW, March 31, page 1).

Throwing ATM gear on leased T-1s can offer more efficient use of T-1 bandwidth. Even with ATM overhead eating up 15% to 20% of each cell, users still can end up with more effective throughput, Nolle says, because idle bandwidth on the line is minimized. ■

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Briefs

NetSpeak Corp., of Boca Raton, Fla., announced last week that it is integrating Natural MicroSystems Corp.'s Fusion IP telephony gateway platform with its WebPhone Gateway eXchange (WGX) devices. Framingham, Mass.-based Natural MicroSystems' Fusion platform is a PC-based IP gateway. NetSpeak will integrate the Fusion platform to offer a WGX with a higher port capacity than its existing line of gateways, which are limited to two ports. NetSpeak is expected to roll out its high-port-capacity WGX later this month.

© NetSpeak: (561) 997-4001; Natural MicroSystems: (508) 271-1000

The Personal Communications Industry Association (PCIA) is asking the government to establish a nationwide policy requiring the calling party to pay for connections to wire-line and wireless phones, unless specifically reversed by an 800 number or other mechanism. In a letter to Federal Communications Chairman Reed Hundt, PCIA President Jay Kitchen said a national calling-party-pays policy would increase wireless usage and enhance the competitive potential of wireless technologies.

Digex, Inc., a subsidiary of IXCCorp., announced it opened a second Web site management facility in Cupertino, Calif., to support its Web hosting service customers.

Digex, of Beltsville, Md., was hosting all of its Web servers in a facility on the East Coast. The second site will allow the ISP to offer its Web hosting customers additional redundancy and Web site mirroring support.

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Jay Kitchen

FCC may ask remote access users to declare their primary phone lines

By David Rohde

Washington, D.C.

The federal government is preparing to go the extra mile to capture new fees on remote access data lines installed in people's homes.

The Federal Communications Commission earlier this month proposed a series of steps to prevent individuals from designating more than one telephone line as their primary residential line.

The FCC needs to draw a sharp distinction between primary and secondary lines because the monthly federal subscriber line charge (SLC) is about to rise from \$3.50 to \$5 a month for secondary lines.

In addition, all secondary residential lines, as well as most business lines, are subject to a new charge called the Primary Interexchange Carrier Charge (PICC) at the rate of \$1.50 for residential lines and \$2.75 for business lines.

Unlike the SLC, which goes directly onto the user's phone bill, the PICC is charged to the carrier chosen by the user as the presubscribed long-distance provider. But the carrier has the right to pass part or all of the cost back to the user (NW, May 12, page 1).

Internet service providers and user groups concerned about corporate reimbursement of remote access lines have protested that the PICC and the impending SLC increase on secondary lines unfairly penalizes Internet and other data-network usage. But the FCC said it has to raise the fee to phase out hidden subsidies in long-distance charges and to help fund a program, starting Jan. 1, that will subsidize carrier and ISP services at schools and libraries.

Among the FCC's new proposals is a requirement that all residential users "self-certify" their primary line. According to FCC staffers, such a process may be needed to avoid a situation in which users subscribe to two lines from two different local car-

riers, leading each to believe it is the primary carrier.

Ironically, given the FCC's efforts to promote local exchange competition, FCC officials believe the lack of user self-certification could benefit new, competitive local exchange carriers that would offer to

lines, especially if the two homes are located in different incumbent local carriers' territories.

But self-certification might be necessary in any case to administer the new fees.

"The dirty little secret is that [telephone company] records tend to be a mess," said Colleen

SUBSCRIBER LINE CHARGE DODGE?

The FCC is considering rules to nix the following ways customers could get around the higher subscriber line charge for second lines at a residence:

1. Buy the second line from a competitor of the local phone company.
2. Designate one phone line for each member of the household as a primary line.
3. Own two or more residences and designate the first phone line at each as their primary line.

charge the lower SLC and no PICC on the first line they sell to each household.

The self-certification program also would require each household to declare its primary residence. That would prevent users with two homes from having multiple primary phone

Boothby, an attorney here for users and service providers. The FCC also will have to sort out the process of identifying group homes and whether or not to give each individual in those homes the right to a primary phone line at the lower rates, Boothby said.

Severino finds a home at NetCentric

By Denise Pappalardo

Cambridge, Mass.

Internet service software provider NetCentric Corp. is counting on a battle-tested industry veteran to help lead it into the next millennium.

The firm last week named Paul Severino, an industry pioneer, as chairman of the board and acting CEO at NetCentric Corp. NetCentric's founder and original CEO Sean O'Sullivan stepped down to pursue other interests, according to a company spokesman.

NetCentric did not offer any additional details about O'Sullivan's decision to only serve on the company's board of directors. But a spokesman did say that O'Sullivan personally asked Severino to become NetCentric's chairman and acting CEO.

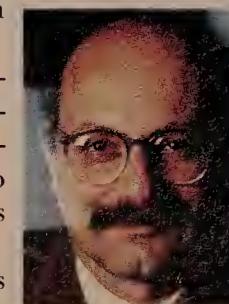
Severino has been an investor in the company since its incep-

tion in 1995.

Severino is heading the company's search for a permanent CEO and will not comment on his new role as chairman until a replacement for O'Sullivan is named, a spokesman said.

Paul MacKay, president and chief operating officer at NetCentric, will continue to manage the company's day-to-day activities.

With Severino's strong history in the network industry, NetCentric is hoping his contacts will draw strong CEO candidates. "I don't think you could find a better man to find a CEO than Severino," said Maury Kauffman, president of The Kauffman Group, Inc., a Cherry Hill, N.J.-based consulting firm.



Paul Severino, acting CEO, is helping NetCentric find a new leader.

The FCC also said it was considering a move that could raise fees for corporate users with very small branch offices.

Until now, single-line business locations — those with a solitary phone line at a site — have been charged the residential SLC of \$3.50 rather than the typical business SLC of \$6 per month.

The FCC requested comment on whether those locations should be charged the higher rate because they are part of a larger enterprise.

The question is doubly significant because the FCC recently ruled that carriers could raise the business SLC to a maximum of \$9 per month based on a complex formula.

To enforce self-certification, the FCC said it is considering auditing carriers' records to see whether the number of primary residential lines declared by residential users matches the number of households according to Census Bureau data. But the FCC said it has tentatively decided against establishing a national database to track access charge information. Maintaining such a database might be more expensive than it is worth, the agency said. ■

Severino's appointment also "says a lot about NetCentric and the company's ability to attract someone like Severino," he said.

Severino also sits on the board of directors at Stratus Computer, Inc. and has founded network companies such as Wellfleet Communications, Inc., which later became Bay Networks, Inc.

Severino served as president and CEO at Wellfleet until the merger and then served as Bay's chairman of the board until late last year.

"It hardly surprises me that a person like Severino . . . would be willing to call it quits after Wellfleet and Bay," said Chris Roeckl, research director at The Robert Francis Group, Inc., a San Jose, Calif.-based consulting firm.

© NetCentric: (888) 767-9273

NCSA certifies secure Web hosting services

Organization assesses security risks and recommends action for Internet service providers.

By Denise Pappalardo

Los Angeles

Users looking for an added degree of security from their Web hosting service provider may gain piece of mind with a new program announced last week by the National Computer Security Association (NCSA).

Announced at Internet Commerce Expo, the NCSA's Web Hosting Compliance program is open to any Web hosting service provider that want to offer its customers security-tested services.

Service providers that meet NCSA's criteria will be awarded the company's seal of approval, said Scott Gordon, vice president of business development at NCSA.

The criteria for Web Hosting Compliance is broken down into three areas — physical facilities, logical network connections and operational procedures — said Christine Silva, product marketing manager for Web hosting services at GTE Internetworking (formerly BBN Corp.).



Get more online:

- A guide to Web outsourcing
- A checklist for securing your Web server
- More details of the NCSA Web certification process

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NCSA representatives will check a service provider's Web hosting server farm for physical security such as around-the-clock staffing and door locks.

They will review the service provider's Web server farm network architecture and check for redundancy. The NCSA also will review how the service provider maintains passwords and authentication procedures.

Using software tools developed by the NCSA and those used by hackers, the association conducts a remote assessment procedure to determine how difficult it is to break into the host servers.

While the NCSA does not recommend specific vendors' products, it does set guidelines for security based on protocols.

For instance, the NCSA recommends that service providers support Secure Sockets Layer applications and use at least 40-bit key encryption.

If your Web hosting service does earn the NCSA's seal of approval, it does not guarantee your site will not get attacked, Gordon said. But the group does believe your chances are dramatically lowered, he said.

GTE Internetworking Dedicated Unix Web hosting service has been deemed NCSA-compliant. While GTE Intern-

working offers a variety of Web hosting services, including services based on shared or dedicated NT or Unix servers, the Internet service provider applied first

for compliance with its Unix service.

The NCSA expects other ISPs to receive the Web Hosting Compliance seal of approval in the near future.

NCSA is an independent, third-party organization based in Carlisle, Pa. The NCSA has other programs that certify Web content and specific site security. This is the first time the NCSA has developed a program that specifically addresses a service.

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Why can't call centers do e-mail?

If your organization is still struggling with the issue of how to respond to e-mail inquiries posted on your World Wide Web site, you've

got plenty of company.

Recently, it has dawned on a lot of companies that they've already invested huge sums in a customer-care organization —

the 800 call center — that could be harnessed to deal with customers on the Internet. But it's a big leap to have your call center take responsibility for answering e-mail from an overburdened Webmaster farming out questions to product-line managers.

Even if you're not sure whether your company's call center agents are qualified

to answer electronic inquiries, there's a more basic problem to address first. It's a question of economics.

All other things being equal, IT expenditures tend to track the training and skill level of the people at the end points. Normally, high-speed LAN architectures, multimedia desktops and customized applications go to engineers and stockbrokers before they go to file clerks and bureaucrats.

The 800 call center is probably the outstanding counterexample of this principle. Call center agents generally do not come from the professional ranks. Answering the telephone is not a glamorous job. Stress and turnover are high.

Yet per-seat spending often is lavish. In a call center, LAN installations and telephone systems, sometimes mashed together via computer-telephone integration, easily cost \$3,000 per seat. Software development and systems integration can bump the tab past \$5,000 per seat.

Why all the expense? Because call centers make money. And call center administrators can program their automatic call distributors to identify callers that are likely to make the company the most money, then put out the red carpet for them. By contrast, even the biggest companies have been embarrassed by reports of e-mail messages being answered weeks late or not at all.

Savvy network managers would love to apply some quality-of-service metrics to electronic inquiries. The technology is available to splice in e-mail along with 800 calls. The problem is that most call center managers can't afford to provide much priority to these messages in their fancy call routing schemes.

That's why carriers and CPE vendors are working on the more complex problem of providing a "call me now" button on Web sites.

But even if that technology matures, you're unlikely to find those buttons anywhere near the typical company's home page. Rather, you'll find them deep within a qualification process after the user has already input some information and shown his buying intentions.

Call 10 companies' 800 numbers and listen to the way the agent directs you to a sale. Answer all the questions, and then tell the agent you were just looking for some information and might call back someday. Most times, the irritation you hear on the other end of the line will be the pressure the agent feels to stop wasting time on nonrevenue-producing activity.

So you can imagine how a poor e-mail message will be treated unless it has some sort of header screaming "I'm ready to buy!"

Rohde is Network World's senior editor of Carriers & ISPs. He can be reached at david_rohde@nww.com.

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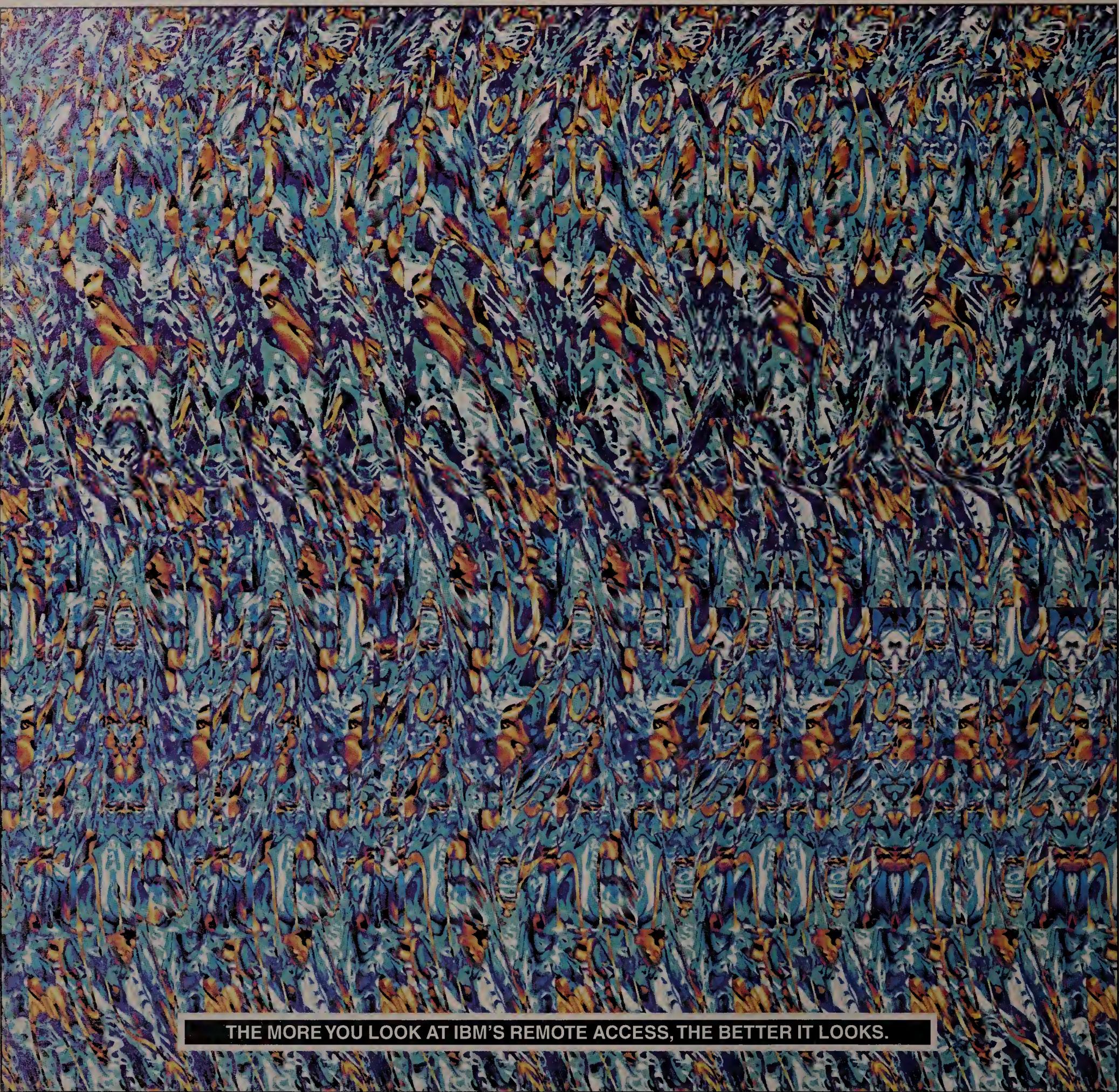
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Briefs

■ Network security product vendor **Cylink Corp.**, of Sunnyvale, Calif., last week purchased **Algorithmic Research BV** for \$83 million in cash and stock. Algorithmic, based in Israel, offers public-key cryptography, smart card and other security products.

■ Having recently caught heat from customers for shipping buggy software, **Lotus Development Corp.**, of Cambridge, Mass., last week delayed the planned Sept. 8 release of its shrink-wrapped **Domino Go Webserver** and **Domino Go Webserver Pro** to patch a security-related bug. As a result, Lotus' initial shipment of the entry-level Web servers now is scheduled for Sept. 19.

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SEPTEMBER '97 DOMINO GO WEB SERVER

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21	22	23	24	25	26	27
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■ **VeriSign, Inc.** this week will announce a digital certificate outsourcing service called **VeriSign OnSite** for customers that want to have VeriSign manage digital IDs for their employees or trading partners. The service, which starts at \$4,995 per year, calls for companies' security managers to send certificate data to VeriSign's certificate authority server, which is maintained and backed up by VeriSign.

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■ **Symantec Corp.** last week began shipping a preview release of **Norton Safe on the Web**, a program that lets end users with Microsoft Corp.'s Internet Explorer on their desktop computers block hostile ActiveX Controls from accessing files on their computer hard drives.

The software is available for a free trial at www.symantec.com.

Marc Andreessen gets a real job

Netscape's cofounder talks about his daily routine, change and celebrity.



At 26, Marc Andreessen is one of the network industry's brightest stars. His story is well known, from helping to create the Mosaic Web browser

11 years to reach this size. It took us about three years, and in those years, we started with a very functional organization. We started with an engineering, marketing and sales group and had VPs of each group reporting to the CEO. But then our development activities got more complicated, so we created multiple product divisions, each with a general manager.

The number of people grew a lot, so we had all the heads of the product divisions, the heads of sales, marketing, finance, IS and HR all reporting to the CEO. And in this industry, the CEO has a lot of duties other than internal management.

[CEO Jim Barksdale] is still ultimately responsible for the company's direction, but

now all the product development activities report to me. If there are major changes that I think we need to make, I can sit down with the general managers and make those changes virtually immediately.

Since your college degree is in computer science, do you have any interest in going back to school to get a formal business education?

No, no, no.

How has the new job affected your daily routine? I've read that you like to get up around 9 or 10 a.m. and go to bed at 3 a.m.

I do that whenever I can. Recently, I've been getting up earlier and earlier because with this job, I actually have to be in the office and have meetings on a lot of days. But my ideal working day is getting up around

noon and going to bed at 6 in the morning because I get the most done late at night. But what I do on most days now is I'll be up by 7 or 8, be working probably by 8 or 9, and I'll probably work through 7 or 8. Then I'll get dinner and probably work at home until midnight.

The new routine must fit your lifestyle better now that you're getting married.

Yeah. I'm engaged, and my fiancee's a morning person. It's been an issue.

I saw somewhere a while back that you had never met Microsoft CEO Bill Gates. I can't imagine that's still true.

That would still be true.

See Andreessen, page 36

More of Andreessen on Andreessen online.

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WHO IS MARC ANDREESSEN?



Claim to fame: Cofounded Netscape in April 1994 after cowriting the Mosaic Web browser while a college student in Illinois.

Current title: Executive vice president of products, Netscape

Education: B.S. in computer science, University of Illinois, 1993

Age: 26

Fun fact: He owns three bulldogs.

as a college student in Illinois to cofounding Netscape Communications Corp., which exploded onto the scene in 1993 with its historic initial public offering.

But his story keeps changing, and the biggest change of late is a new job title. Netscape's chief technology officer and chief evangelist for the past few years is now its executive vice president of products. That means Andreessen will have a much more hands-on role in pushing Netscape to respond to customer demand and the moves of rivals such as Microsoft Corp.

Andreessen recently spoke with *Network World* News Director Bob Brown about personal and industry issues. Part one of our interview focuses on Andreessen, while part two will detail his industry outlook.

What does your new job entail?

They gave me a real job. A month and a half ago, I had a staff of three. Now I have a staff of about 800. Luckily, I'm not managing them all directly. We don't have that flat of an organization.

Why the change?

Netscape has about a \$550 million run rate and about 2,200 people. It took Microsoft about

Electronic Catalogs

Open Market livens up Web-based commerce

**By Ellen Messmer
Cambridge, Mass.**

Open Market, Inc. last week announced LiveCommerce, an application for building searchable Web-based catalogs that can present customer-specific views of products and pricing information.

The Windows NT-based program is well suited for business-to-business trading because a buyer using a Web browser can access information such as manuals, CAD drawings or product specification sheets that can be presented in a separate window.

"You can browse, do a text search, a hierarchical search or a parametric search," said Ian Reid, Open Market's director of product marketing.

Watertown, Mass.-based electronics manufacturer C&K Components, Inc. is converting its seven paper catalogs of switch parts into electronic form via LiveCommerce.

The company sells primarily

ers can configure a switch online and order it. Hunt said that the LiveCommerce "rules engine" will prevent customers from combining electronics parts that do not work together.

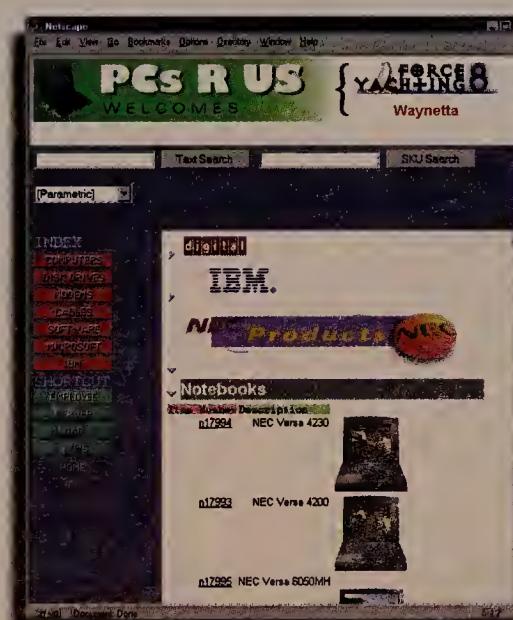
Although LiveCommerce also lets companies individually customize product and pricing views, C&K will not make use of that feature until it has had the catalog online for a while.

"We want to reach new customers with the electronic catalog," Hunt said. "We'll let our existing customers know about it, too, and see what happens. Electronic commerce is new to us, but our goal is to make it easier to do business with C&K."

LiveCommerce costs \$45,000.

© Open Market: (617) 949-

7000



Open Market's LiveCommerce electronic catalog lets businesses personalize the shopping experience for their customers.

to distributors that typically construct switches out of the 30,000 different parts manufactured by C&K.

Scott Hunt, MIS director at C&K, said his company is designing its electronic catalog so buy-

NET INSIDER

Hooded freedom

This is not the first column I've written about U.S. policies on encryption technology, and I fear it will not be the last.

According to *The New York Times*, the Clinton administration is quietly circulating proposed legislation that would mandate the inclusion of key escrow features in any encryption software distributed in the U.S. At this time, the administration is not proposing that use of the features also be mandated, just that they must be included in all software.

If this information is true, it is either a very fast turnaround or another example of the perfidy that passes for normal discourse in Washington. As recently as Sept. 4, a spokeswoman for Vice President Gore said there was no such effort and that "the administration does not support domestic controls on encryption."

Her statement came in response to the

testimony of FBI Director Louis Freeh, given in front of a Senate Judiciary Subcommittee. In his testimony, Freeh said, "If we had legislation that required the immediate decryptability of any product used, sold or distributed in the United States, our domestic law enforcement interests would be protected." While asking for new laws, he stated more than once that "we're not asking for any new powers or new authorities."

But his testimony raises at least three questions: Would the requested laws be effective? Is the proposal secure? And is the FBI asking for new powers?

Very good non-key escrow encryption technology is freely available today. The Massachusetts Institute of Technology has been distributing 300 to 500 copies of the Pretty Good Privacy encryption package per day for more than two years, and other institutions are distributing it as well.

In light of this level of existing distribution, it is hard to see how establishing rules for new software in the U.S. will make the existing software go away — or is the FBI depending on bit rot? Are the drug dealers, spies and terrorists so dumb that they cannot find existing software or buy a copy from some place that has not outlawed it?

It is hard to judge how secure a system like the one proposed by Freeh could be since details of how the escrow agents themselves would operate weren't disclosed.

But there is more than a little bit of an "all eggs in one basket" feel to this proposal.

Just how hard would it be for someone who really wanted to know a particular escrowed key to persuade with money or threats a system operator with legitimate access to the information?

Even without requiring the escrow features to be turned on, the FBI is asking for new powers (and if this passes, expect the on/off switch to go away soon).

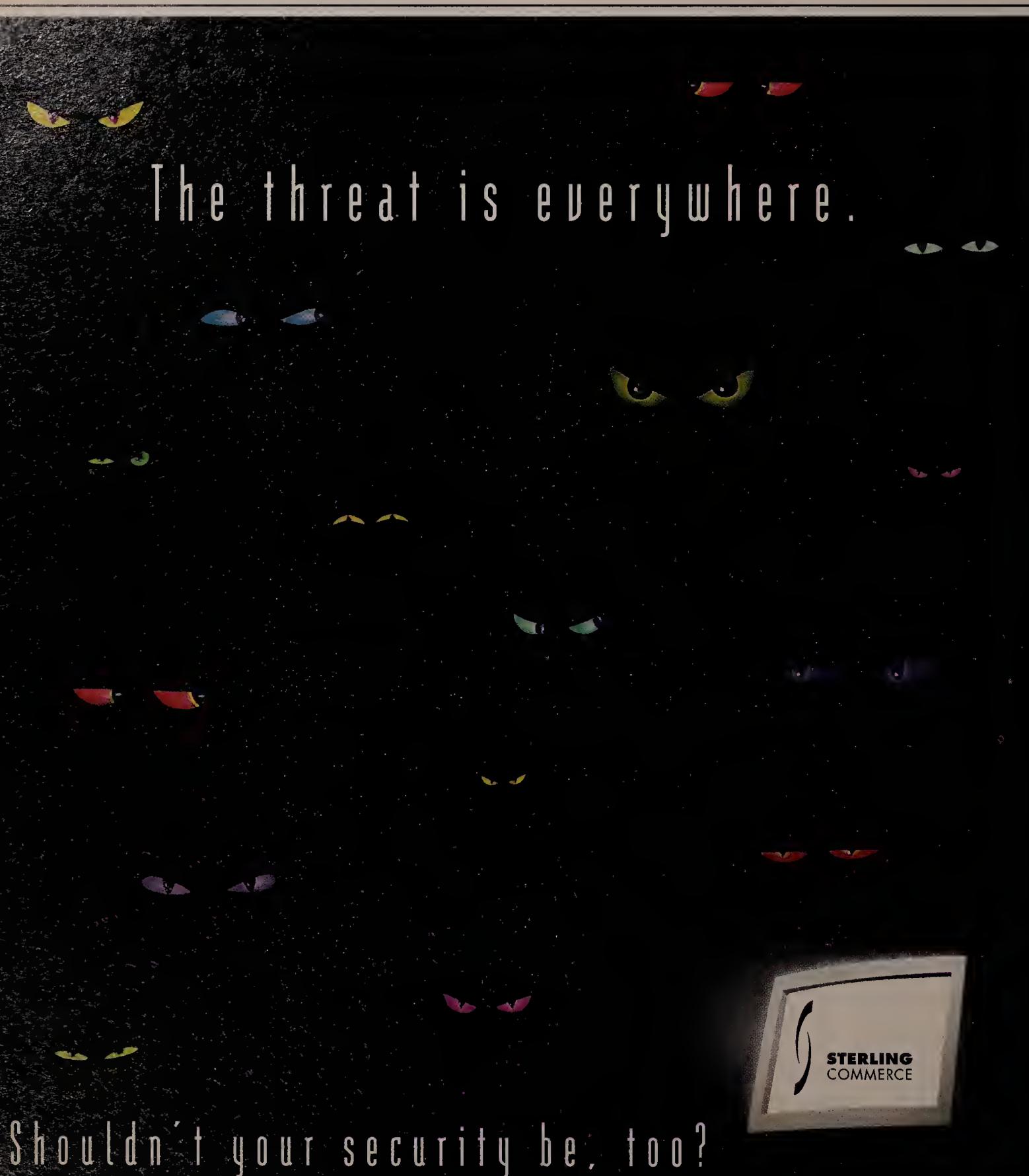
Before this proposal, even though law enforcement agencies could listen in, there was nothing that said they had to be able to understand what was being said. This proposal is the equivalent of requiring that you speak English when talking on the phone.

Addressing Americans about freedom, the poet Robinson Jeffers wrote: "You will tame it against it burn too clearly, you will hood it like a kept hawk, you will perch it on the wrist of Caesar." This FBI proposal would do little but bind our freedom.

Disclaimer: Although Harvard has been on the side of freedom for many years, long before the U.S. was the U.S., the above warning is my own.



Scott Bradner



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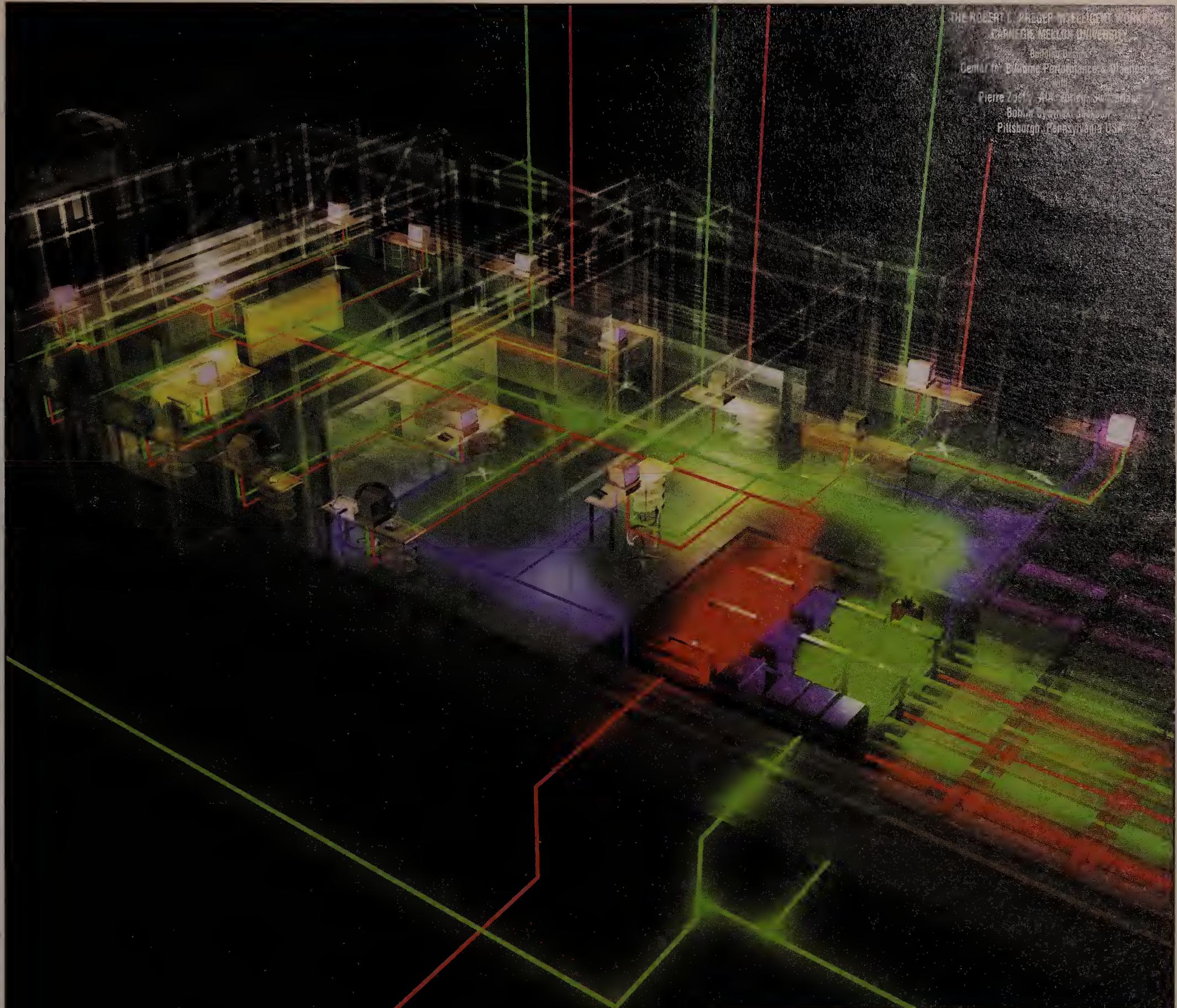
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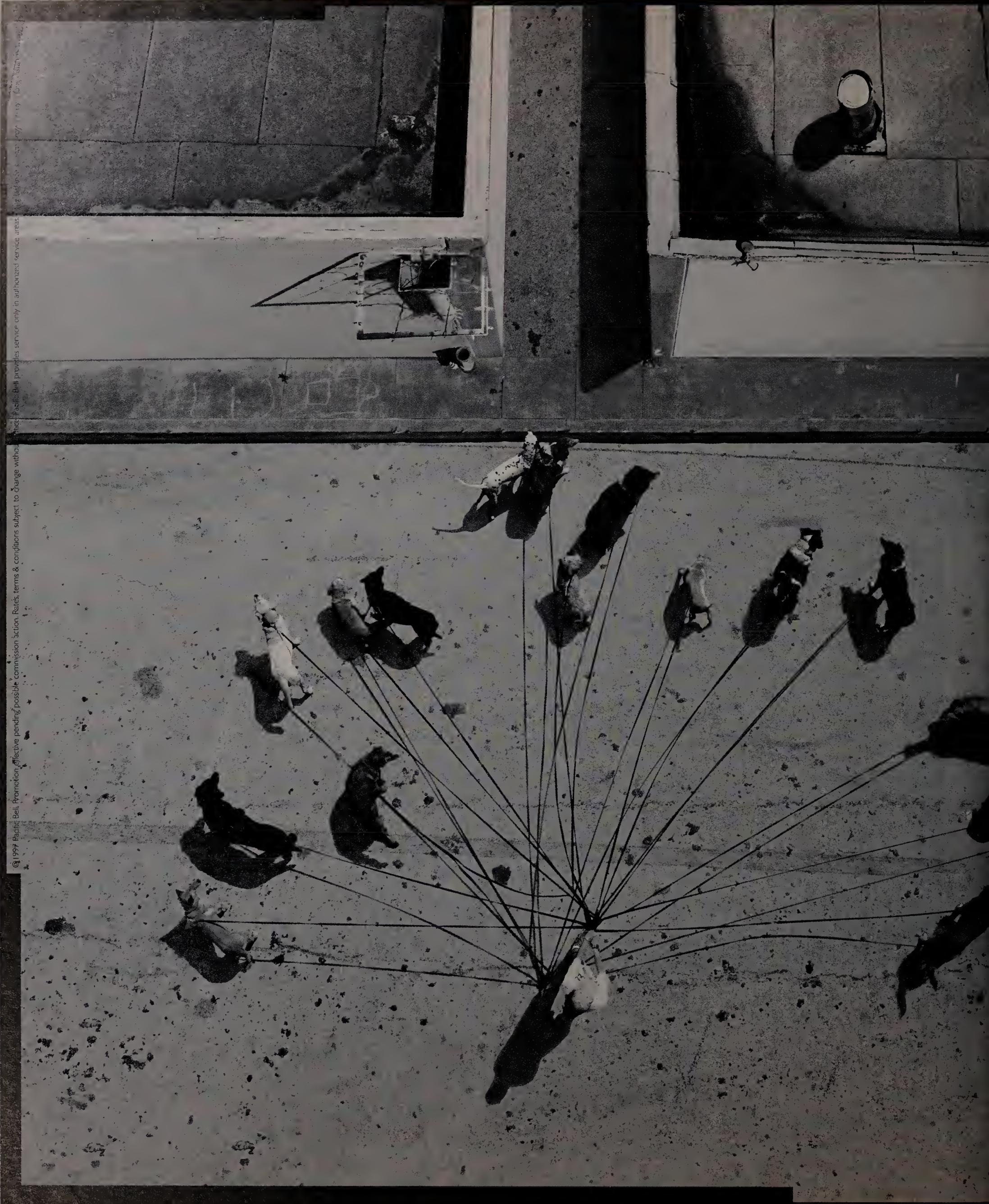
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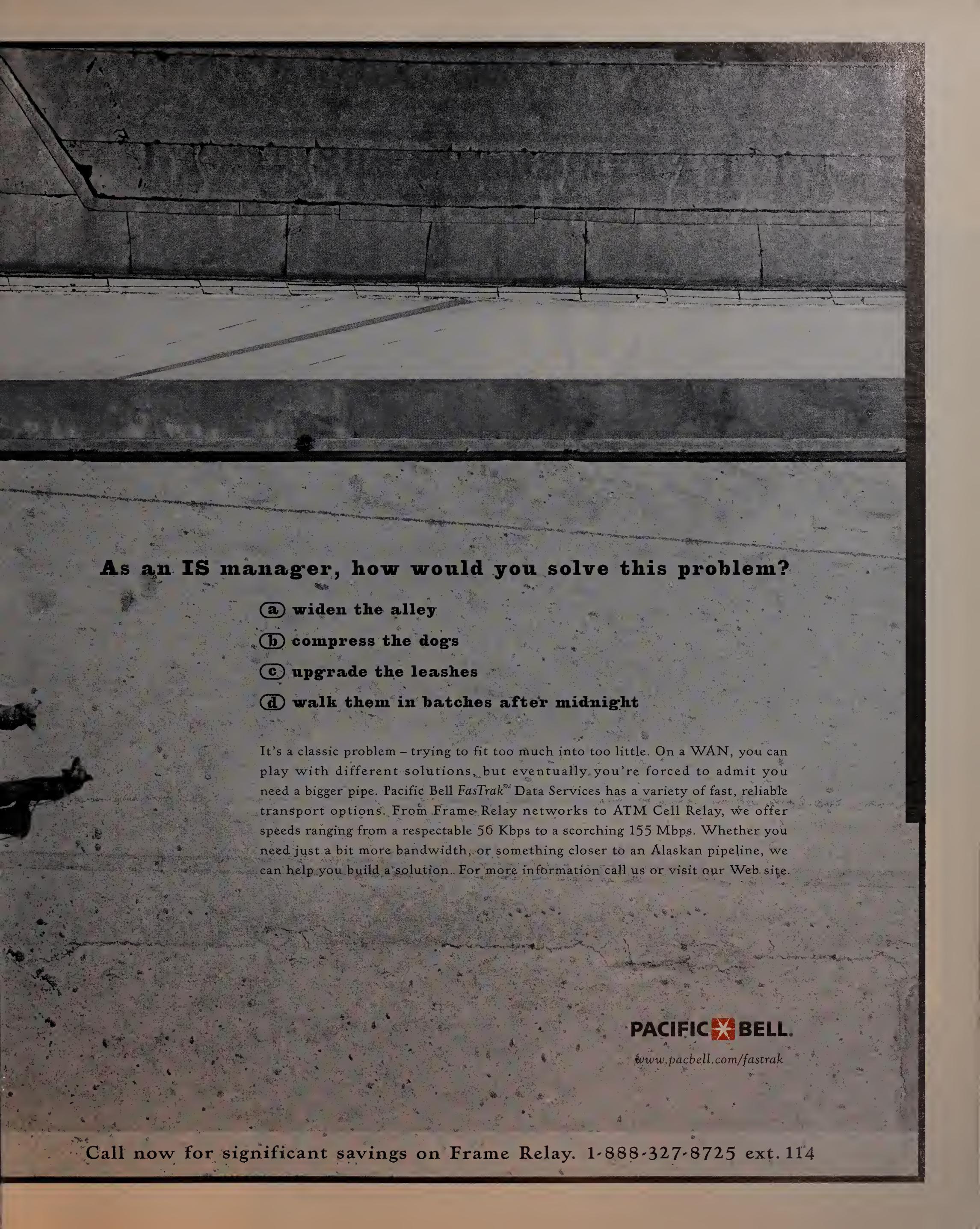
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Andreessen

Continued from page 31

How about Oracle Corp. Chairman Larry Ellison? What's your relationship with him?

I have met Larry. It's pretty much a business relationship. He's funnier than

people give him credit for. He's also very, very smart. Many people miss that about him.

What's it been like to have your life change so dramatically?

I'm probably the wrong person to ask because it's hard to be that introspective. From my standpoint, I sort of have the

personality that wants to work all the time anyway.

To what extent have you become a celebrity?

When there's a cover story in something like *Time*, there's a rush of attention for a couple of weeks, and then it falls off. From time to time, people ask for my auto-

graph, at trade shows sometimes. But I spend a lot of my time right in Palo Alto and Mountain View [Calif.], and people are pretty blasé about a lot of this at this point.

So it's not quite like being a sports celebrity like, say, Cowboys quarterback Troy Aikman?

Right, nor Madonna.

How has the media treated you?

Fine. There's sort of two stories: the story of "Oh, the wonder of it" and then there's the "Oh, the shame of it" story, and they sort of go back and forth. You get waves of praise and adulation, and then you get waves of just bitter criticism, and then you get more waves of praise and adulation. But by and large, the thing about executive celebrity is it's incredibly useful from a business standpoint because all the coverage has resulted in tons of PR that would have cost us hundreds of millions of dollars from an advertising or marketing standpoint. So I don't care what you call me as long as you spell my name right.

It gets misspelled a lot?
Oh yeah.

I understand that down the line you'd have an interest working for a big venture capital firm like Kleiner Perkins Caufield & Byers. Why?

They have a lot of benefits being able to work with start-ups without the liability. They get the rush and the involvement with three, four or five companies at a time. But there are people who are actually responsible for running the company, so you get to be involved in the creation of all these different businesses and then sort of their evolution without having to actually have a full-time job at any of them. And you get to participate in a pretty broad cross-section of the market.

What's driving you these days, three years into Netscape?

This keeps getting more fun because we keep getting bigger. Doing a start-up is fun, but it's fun in sort of a perverse way. It's sort of masochistic because you're so small and inadequate from an operational standpoint that you can't do very much. You spend a lot of time just trying to do the basics — make sure the garbage gets taken out and make sure you have enough cash in the bank. You swing between euphoria and depression because one day things look like you're on top of the world, and the next day it looks like everything is caving in. You have no leverage. You can't engage a large number of customers or partners, even if there's 300 of them calling you. So now that we're bigger, we have a tremendous amount of leverage. We can take all these ideas that we have and implement them on the product development side and get them out in the market extremely quickly and on a broad scale.

Next week: Andreessen's industry outlook.

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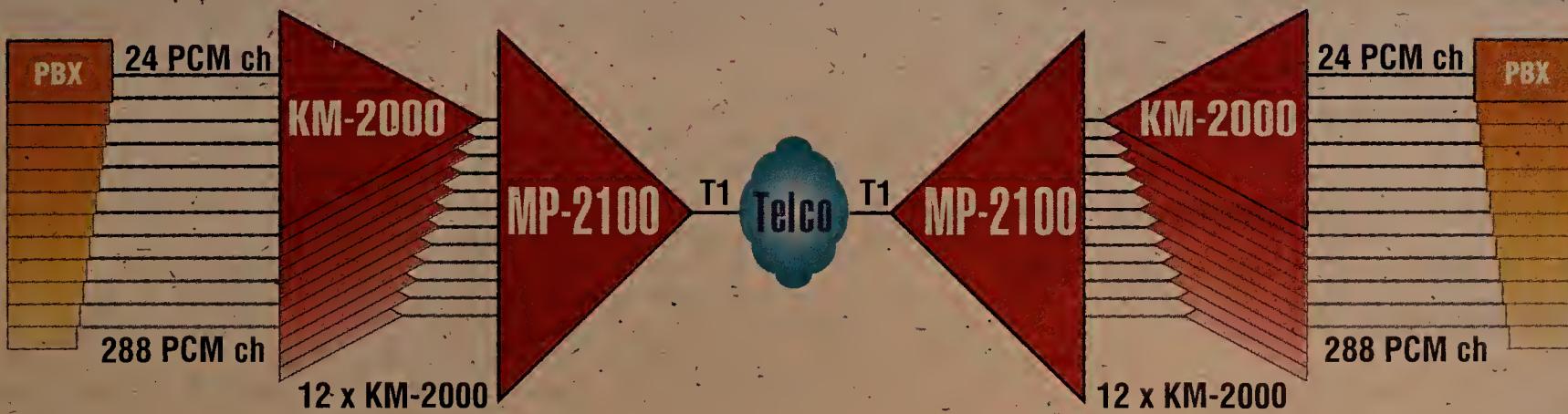
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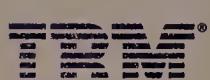
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Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

At our site, file and print services hang for long periods of time when we use Novell, Inc.'s NetWare client and Microsoft Corp.'s Client for Microsoft Networks, both of which use the Microsoft Network Driver Interface Specification (NDIS)-based LAN drivers on Windows 95. The problem goes away if I remove Novell's client and use Microsoft's NetWare client instead. Any ideas?

Via the Internet

First, get Version 2.12 of Novell's IntranetWare Client for Windows 95. When you install the client, make sure the box for upgrading any NDIS drivers to ODI is not checked. I have found this selection does the exact opposite of what it says it does.

If possible, you want to try to avoid using the ODISUP driver to talk to the network card. In a few machines on which I have used this, results were similar to, if not more severe, than those you've experienced. In the worst case, the PC constantly went to the blue screen and displayed an OE message. We could only resolve the problem by not using the ODISUP driver.

In addition, check with the manufacturer of the network card to make sure you have the latest available driver. You also might try using a different vendor's network card, particularly if you are using a clone. I have had some success with 3Com Corp.'s 3C509B and Microdyne, Inc.'s NE2000 network cards.

You also should check which programs or services you are loading on the problem system. By removing each program or service one at a time, you should be able to tell if one of them is causing the problem. An exclamation point or a red "X" beside a system icon is indicative of a configuration problem. Try bringing up the workstation in safe mode with network support to see if the problem still shows. If it does, this would seem to confirm that one of the additional services and the NetWare 32-bit client are conflicting.

Available bit rate services deliver quality of service in ATM networks

By Guy Trotter

One of ATM's greatest advantages is its built-in ability to support user-specified quality-of-service (QoS) levels.

To deliver QoS, the ATM Forum has defined five service classes, including available bit rate (ABR) service.

ATM allows users (or applications) to obtain end-to-end connections at varying bandwidth levels, making ABR well suited for the flexible transfer of data, voice and video. Defined service classes allow users to trade off bandwidth efficiency, delay and potential cell loss to achieve an acceptable QoS level.

For example, unspecified bit rate service promises best-effort delivery but may be subject to high cell loss rates and unpredictable network management capabilities.

Constant bit rate provides minimal delay but requires that a fixed amount of bandwidth be allocated for the entire session. This is an appropriate approach for voice but inefficient for many data applications.

Variable bit rate services come in two flavors: real time and nonreal time. These services offer somewhat more flexibility with service guarantees, but users must specify in advance a range of parameters that describe their potential traffic "profile," such as peak and sustained cell rates or maximum burst sizes.

Unfortunately, it is difficult to strictly characterize many of today's unpredictable applications within these parameters because there may be long periods of low data transfer followed by large bursts of data.

Go online for:

- More Information on available bit rate behavior and other ATM white papers
- The ATM Forum's Traffic Management 4.0 specification

WWW.nwfusion.com

Moreover, if actual traffic falls outside the profile — as unpredictable bursty traffic often will — cells may be discarded, resulting in the corruption of application-layer information and a sharp decrease in throughput.

What is needed, then, is a bandwidth-efficient, low-cell-loss service with the flexibility to handle large data bursts.

Enter ABR

ABR provides a mechanism for dynamic allocation of available bandwidth equitably among ATM network users. In many

wishes to increase its transmission data rate, it indicates the request via an RM cell transmitted into the network.

The RM cell is then processed and passed progressively through each switch in the connection.

Every switch examines the RM cell and determines whether it can support the requested rate increase, taking into account a fair allocation of bandwidth among all other active ABR sources.

Each switch can choose one of three options. If the switch can

or resets its rate to the level specifically indicated by the RM cell.

As long as the user transmits at the approved rate, cell loss rates are guaranteed to be low. Additional bandwidth can be dynamically requested and obtained, maintaining the low-cell-loss rate.

On the other hand, ABR also helps manage overall network resources by instructing users to reduce transmission rates if needed and releasing bandwidth to the network for use by other sources.

Increased efficiency

The result is increased application and network efficiency. Because cells are transmitted only at rates that can be handled by the network, fewer cells

are lost, requiring fewer frames to be retransmitted, and bandwidth is allocated more equitably among users.

Most ATM equipment manufacturers currently are implementing ABR support in their switches. Based on normal testing, evaluation and deployment cycles, it is reasonable to expect that network users should begin to see ABR services by mid-1998.

Given the growth of applications with varying nonreal-time transmission requirements, ABR should become a key building block for ATM network managers in the future.

Trotter is a product marketing engineer for Hewlett-Packard Co.'s Communications Measurements Division in Edmonton, Alberta. He can be reached at guy_trotter@hp.com.

UP CLOSE

Covering quality of service

Available bit rate (ABR) is but one of the ways vendors will control traffic coming through ATM switch-based networks. The idea behind ABR and other traffic control methods is to give network administrators control over data delivery and to give users quality of service guarantees.

respects, ABR represents a best-of-both-worlds offering for applications such as Web services because it accommodates varying traffic profiles without being a bandwidth hog.

ABR operates as a feedback mechanism that utilizes special ATM cells, called Resource Management (RM) cells.

RM cells carry requests through the network to determine if higher transmission rates can be supported. RM cells then deliver an answer to the originating user.

Here's how: The user begins by transmitting data cells at an initial rate, interspersed with RM cells. If the switch

support the request, the RM cell is passed along unchanged.

If the switch is experiencing congestion but can still accommodate the current user traffic rate, it modifies the RM cell to indicate that the source should not change its rate of transmission.

If the switch is experiencing congestion that is slowing the network, it can modify the RM cell to indicate that the source should reduce its user traffic rate. Or the switch can tell it to transmit at a specific data rate.

Finally, the RM cell is looped back to the source, which takes the specified action.

It increases, maintains or decreases its rate of transmission

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney by phone at (508) 875-6400 or e-mail at michael_cooney@nww.com.

Is this any way to sell Internet service?

I don't usually write about marketing programs, but Cisco has undertaken what, to my knowledge, is the first program aimed at landing more carrier and Internet service provider business by using network managers as bait.

The Cisco Powered Network program, launched earlier this year, is akin to the Intel Inside campaign that made the semiconductor giant virtually a household name.

Cisco is pushing Internet access, frame relay and ATM providers to market its services under the Cisco Powered Network logo. The idea is to convey to customers like you that the services will be more reliable and cost-effective because Cisco is at the heart of the network.

This is no slapdash plan. Providers must have a majority of Cisco routers and switches in their networks and agree to spend a significant amount—in the range of \$5 million per year—to expand and upgrade their Cisco-based nets, according to information from Cisco's Web site (www.cisco.com/warp/public/779/servpro/cpn/providers.html). Partners also have to maintain high service quality or risk losing the brand.

In theory, this is brilliant. Cisco leverages its strong brand recognition among network managers to create pullthrough for its products in the carrier/ISP market. The plan also strengthens Cisco's relation-

ships with service providers: Once a carrier starts using that branding, it will be awkward to dump Cisco gear in the future. The program offers providers an opportunity to differentiate their offerings—something they need in a very competitive market.

So far, six companies have signed on: @Work, the business arm of the @Home Internet access venture; BT; CompuServe Network Services; Digex, an ISP; Netcom; and Primus Telecommunications Group. Cisco CEO John Chambers told me last week that a whole bunch of other deals are pending.

Give Cisco credit for being the first of the data network vendors to use its awareness in the corporate market to boost its presence in the rapidly growing carrier/ISP market. But will this kind of branding program really work?

Chambers says emphatically, yes. He says customers want to know their network is Cisco end-to-end. But I have my doubts.

Am I missing something here? As a Cisco customer, do you feel better knowing your provider has based its network on Cisco equipment? Are you more likely to purchase Internet access or frame relay from a carrier whose network is Cisco-based? If you don't use Cisco equipment, do you care at all?

To steal a phrase from MTV, do want your Cisco Powered Network? *John Gallant, editor in chief*

jgallant@nww.com

Java Break • Ted M. Young

Wanted: An open framework for Java development tools

At last month's Java Internet Business Expo in New York, I participated in a panel that compared the various Integrated Development Environments (IDE) currently and soon to be available for Java (you can view my slides at www.javatrain.com). Just as bookkeepers spend their days in accounting programs, Java developers spend their days in IDEs. The better the IDE, the more productive the developer, and therefore, the higher the quality of the programs created.

As it turns out, we panelists weren't able to reach a consensus on the best Java IDE—partly because some IDEs still are in the beta stage (Powersoft's PowerJ) or require another revision to be usable (IBM's VisualAge for Java, which needs performance and resource tuning). However, I think it really had to do with the competition among IDE vendors to get the most check boxes in comparative reviews rather than develop an environment that will make Java developers more productive.

To demonstrate, when I asked the audience how many of them worked for tools vendors, only one person of more than 150 raised his hand. Either the other tool vendors were afraid to raise their hands (which implies they realize most developers are not thrilled with existing tools and were afraid of an uprising), or the vendors don't care enough about what developers need to take the time to hear what the panel and audience had to say.

Most of the developers I talked to at the show work the way I do: They use multiple IDEs depending on what's best for the project or stage of development, matching the strengths of the product to the task at hand. One IDE may have a better debugger, another a better graphical user interface painter and a third a faster compiler. However, switching between IDEs is cumbersome, and, therefore, developers often stick with one IDE that may be fine for one task, but not appropriate for others.

Will this problem go away once the IDEs mature? I doubt it. There always will be features in someone else's IDE that you'd like to have, even if it's missing the features you're used to. So what's the answer? Look at Microsoft's Visual Basic Version 5.0. One of the great—and underrated—features is its open framework for integrating other tools.

Back in 1993, when I was trying to integrate a product I had devel-

oped into Visual Basic, I had to hack and kludge my way to get it to feel like it was part of Visual Basic. I was successful, though there were still times when the integration was fragile, and it took a lot of development effort that would have been better spent improving my product.

An open framework is vital to the continued growth of development tools: We need the ability to fully integrate third-party tools. Right now, we can only do the equivalent of painting a car a different color, when what we really want is to put in a dashboard that supplies more information about how the car is running. This way, we could select an IDE that has most of the desired features and install third-party add-ons that improve the areas in which it's weak.

What can you do about this? Demand an open framework from your IDE vendor. You're the customer; you can switch from one IDE to another without much trouble (remember, developers do it all the time) and the vendors know this. The first vendor to have an open, documented framework will get my wholehearted recommendation—even if its debugger is a little slow or its source code editor is a little confusing—because I know I can replace them with something else when I want. Am I asking too much? From a technical standpoint, I don't think so. I've seen IDEs developed in universities that are light years ahead of the current crop of commercial IDEs, and they're not prototypes but systems in use. Only an open tool framework will take programmer productivity to the next level—don't settle for anything else.

Young is chief technology officer at Advanced Web Technologies Corp., a Java training and mentoring firm in New York. He can be reached at (212) 487-9064 or tyoung@javatrain.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

The last laugh

Regarding your editorial "Geeks and nerds, arise!" (Aug. 11, page 34):

This geek works a banker's 40 hours, makes well into six figures, owns his home, drives a red sports car or a sport utility vehicle (whichever suits my whim) and goes home to a beautiful, young wife. This with no college degree, after a relatively short seven years in the industry. My salary has increased almost 400% in these seven years. What a tragedy to be thought of as a nerd!

As the popular Northwestern University football cheer goes: "That's all right, that's OK, you're gonna work for us someday!"



Get your SNA intranet now

Since last fall, I have been preaching that there is only one trend when it comes to SNA networking: the move toward SNA-capable intranets. Recent announcements from IBM and Bay Networks have brought the trend to a head.

Last month, IBM announced the inclusion of TCP/IP-to-SNA gateway functionality in the form of a tn3270E server on its channel-attached 2216 bridge/router (NW, Aug. 18, page 1). At the same time, Bay announced the 5745 Enterprise Server Module (ESM), a channel-attached gateway for its System 5000 switch, replete with Web-to-SNA conversion technology (NW, Aug. 18, page 78).

Throw in the tn3270E server that Cisco added to its channel-attached router last fall and SNA users now have viable and attractive options — albeit with varying levels of functionality, scalability and sophistication — from all three of the major players in SNA integration.

Now's the time to evaluate the technology you will need to transform your current SNA/Advanced Peer-to-Peer Networking-only or multiprotocol network into an SNA-capable intranet. If your corporate intranet is not integrated with your data center, you have essentially created an apple pie without any filling — roughly 70% of your vital corporate data is likely to reside within the data center.

An SNA-capable intranet integrates data centers consisting of IBM mainframes or AS/400 minicomputers with a TCP/IP-centric intranet, thereby providing support for SNA/APPN traffic across the TCP/IP backbone.

The primary technologies required to successfully implement an SNA-capable intranet are Data Link Switching (DLSw) to support legacy SNA devices, tn3270E and browser-based access to enable PCs to interact with SNA/APPN applications. And channel-attached gateways to provide tn3270E server and Web-to-SNA conversion.

Bay's ESM is a significant milestone in channel-attached gateway evolution. It is the first channel-attachable switch; Cisco's and IBM's equivalents are bridge/router based. In addition, ESM, which is based on proven hardware and software from Computer Network Technology Corp., is the first general-purpose gateway to include integrated Web-to-SNA conversion technology.

However, the ESM lacks some key features, such as TCP/IP off-load, 3270 user-interface rejuvenation capability and High Performance Routing (HPR) for SNA data transfers across the channel. It also is not scalable enough to support very large SNA networks.



Nonetheless, the ESM is a credible offering with an attractive entry price that should appeal particularly to current Bay customers and users with small to midsize SNA networks.

IBM's intent to provide tn3270E server functionality on channel as well as LAN-attached 2216s and low-cost 2210 multiprotocol routers is very good news for SNA users. Until now, IBM was the chief proponent of having the mainframe perform the functions of a tn3270E server. Though tn3270 has its origins in mainframe-based protocol conversion, there is no need to use expensive mainframe resources for such a network-specific function today.

With its new tn3270E servers, Host-on-Demand offering for browser-based access to SNA and DLSw on its 2216 and 2210 routers, IBM has all of the necessary products to enable you to build a true SNA-capable intranet.

Nonetheless, IBM seems to be reluctant to accept that the demand for HPR is now going to be restricted to the data center and interdata center operations, as opposed to the WAN.

With a new initiative dubbed Enterprise Extender, IBM is attempting to create a standard for routing HPR over IP. While HPR is a powerful, elegant and rather efficient network scheme, the battle royal between SNA/HPR and TCP/IP has already been won, hands down, by TCP/IP. Not only is the WAN going to IP, but the overriding trend is toward TCP/IP clients — especially PCs and workstations.

Enterprise Extender is intended to replace DLSw. But there's no time to wait for it. DLSw is proven, reliable and ubiquitous. So let's not delay the move to SNA-capable intranets by waiting for another standard.

Moreover, running HPR over IP would result in a huge amount of functional overlap that would make the process inefficient and inelegant.

So the bottom line here is simple. The future of SNA/APPN networking can be irrefutably summed up with one phrase: SNA-capable intranets. The appropriate technology is now available. It does not and will not get any better than this.

Don't wait. Call your favorite SNA integration vendors and start talking to them about getting your SNA-capable intranet off the drawing board and into the enterprise.

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or aguruge@mcimail.com.

Brian Turner
Schaumburg, Ill.

Vigilante justice

Regarding Douglas Welch's column "Network vigilantes should get out of Dodge" (Aug. 11, page 35):

There's no excuse for the AlterNIC incident and various Web site alteration attacks. But the only thing wrong with denial-of-service attacks and mail bombs on domains that pass excessive spam is the fact that the major Internet service providers didn't take action before the vigilantes did.

Imagine that all peering contracts contained a spam ceiling. If more than some percentage of the mail, or newsgroup posts, arriving at xyz.com from lazy_isp.com met the definition of spam, all mail arriving from lazy_isp.com would be bounced for, say, 48 hours. For a second offense in the same year,

lazy_isp.com's mail would bounce for seven days. And at some point, a formal "death penalty" would be applied, essentially permanently preventing lazy_isp.com users from sending mail to xyz.com users.

This scheme also addresses the main reason Welch's legal intimidation scheme would fail: the international nature of the 'Net.

Welch may be able to use fraud laws to protect his site from U.S. attackers, but American courts can't do anything about hackers or spammers on, or routing through, some offshore island.

Only by disconnecting the

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outlaws and those who harbor them can we stand any chance of cleaning this up.

Doug Smith
Nashville

Voice lessons

Your informative article "Frame relay with a twist of voice" (Aug. 18, page 33) mentions that Concert's voice permanent virtual circuits (PVC) will have guaranteed maximum round-trip delays lower than 200 to 300 msec.

Since these delays are longer than voice circuits over satellites and people voted with their feet that using satellites is not acceptable for voice communications, how many are going to flock to voice over frame relay?

Now let's look at the total cost of a voice call. Carrier charges are only, say, 10 cents per minute, but the labor cost of the two speakers is \$1 per minute each. Thus, the total cost of the call is

\$2.10 per minute.

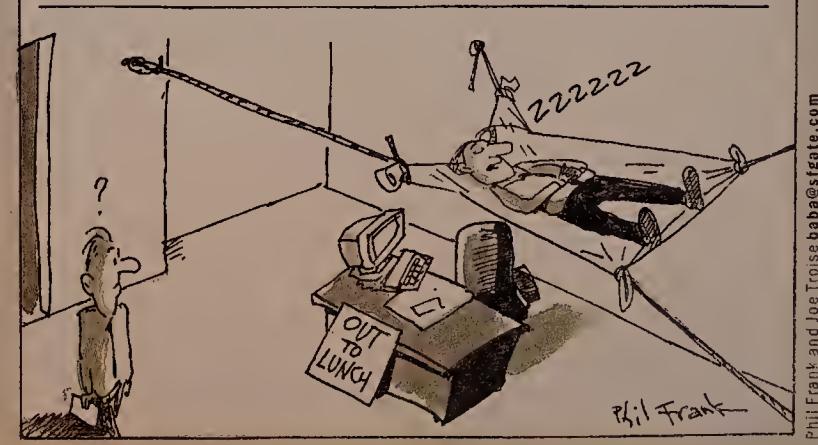
Even if the call is free, a 5% increase in talk time will increase the total cost of the call, anger employees and customers, and result in lost business. It sounds

Teletoons

to me like putting voice over PVCs is a bad business decision.

Ronald Brown
President
Ronald O. Brown Consulting, Inc.
Melrose, Mass.

Network Manager's Handbook
• HINT #47.
Don't throw away those ugly, extra-large vendor t-shirts you always pickup at networking shows.





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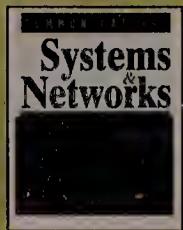
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SPECIAL SECTION

DIRECTORY DIRECTIONS

Directories are branching out

Now you've got to determine whether Microsoft's ADS or Novell's NDS will best integrate with your enterprise.

By Gary Rowe and Daniel Blum

With Microsoft Corp.'s Active Directory Services (ADS) becoming closer to reality, it's time to assess your directory strategy. There's lots at stake, given that directories are becoming an ever more important network linchpin, weaving their tentacles into everything from e-mail systems to net management tools.

With proper planning, the next generation of standards-based directories could significantly ease your administrative burden.

The directories of the future will benefit end users, too. Along with enabling file and print services, these rich information repositories will allow users to access "white pages," departmental views of employees, or browse for information about resources such as printers, scanners or conference rooms. Workers will be able to use public-key certificates contained in the directory to handle encrypted or digitally signed documents in e-mail, browsers and groupware or workflow applications.

The tough part will be integrating an enterprise directory with your heterogeneous network. Both Microsoft and Novell, Inc. are promising to deliver tools that integrate their respective directories with either IntranetWare or NT LANs, not to mention the rest of your enterprise. There's likewise a crew of third-party vendors hawking metadirectories — software that integrates multiple directories.

NDS comes closest to meeting directory services needs because it already supports multiple server views, multiple data types, multiple operating system platforms and the Lightweight Directory Access Protocol (LDAP). NT directories are quite limited, however, by a cumbersome access control approach based on a flat domain namespace, lack of support for LDAP, a limited set of data types and an inability to operate across platforms. ADS will eventually provide similar capabilities to NDS, but Microsoft only plans to implement it on NT.

Of course, ADS and NDS aren't alone on the

playing field. Many third-party developers are joining the fray by providing metadirectories or enterprise directory services that leverage existing network operating system (NOS) directories.

But users don't necessarily like what they see in NT's domain structure.

Administrators create, delete and update domain user IDs and resource entries with a limited set of fields via NT User Manager. Servers replicate their directories, or registries, to create a browse list for the domain. Administrators designate one server as the primary domain controller and another as the secondary domain controller. Whenever users or applications access an NT server-based resource, such as a printer, the NT Security Access Manager (SAM) consults a domain controller to see if that access is allowed.

Cross-domain trust relationships let one domain controller talk to a controller in another domain.

Through trust relationships, for example, a user in Domain 1 could obtain rights to access resources in Domain 2. However, that user would first have to be configured in Domain 2. If multiple Domain 1 users were given Domain 2 access, they could be collected in a "global group" and added to the list of authorized users for Domain 2.

The NT server directory doesn't span domains, so there's no single point of administration for the enterprise as a whole. However, you can implement a single NT network logon for the enterprise if you set up trust relationships among all your NT domains.

"The domain relationships in NT are a nightmare as soon as you go into a multiserver environment," says Chris Meyers, a senior systems analyst at James Moore and Co., a technology consulting company in Gainesville, Fla.

It's been tough to implement enterprise networks with NT directories, but Microsoft aims to ease the process with ADS. Scheduled for beta release to selected partners and independent software vendors at the Microsoft Professional Developer's Conference in San Diego this month, ADS will be contained in NT 5.0 when it ships next year.

The key development objectives for ADS are to provide a single point of administration across an enterprise, single network logon to any network service and directory integration with server applications. This release will be particularly important to NT users because ADS is Microsoft's first enter-



CANDACE MAMMarella

Whatever you choose, remember that it can be risky to rely on a sole vendor. Reduce that risk by continuing to demand standards support.

NT Server of today and tomorrow

Microsoft's marketing muscle has helped propel NT Server into the spotlight. As low-cost NT application servers proliferate and third-party application support for NT swells, the NT 3.51 and 4.0 directories are gaining lots of visibility.

SPECIAL SECTION: DIRECTORY DIRECTIONS

prise-class directory service (see story below).

"The Active Directory will deliver support for millions of objects and a very efficient multimaster replication model for replicating data," says Jeff Price, Microsoft's NT Server product manager in Redmond, Wash.

Narrowing in on NDS

Maybe so. But despite the increasing popularity of NT as an application server, NetWare continues to dominate the NOS market. Part of NetWare 4.X and IntranetWare, NDS is backward-compatible with NetWare 3.X via bindery emulation. However, users have been fairly slow to move to NetWare 4.X and NDS, largely because of the complexity of planning enterprise directories.

NDS is evolving from its proprietary background to embrace standards. For instance, the

schema supports a hierarchical, server-spanning namespace based on the X.500 model. Novell also recently added LDAP support to NDS.

Multiple servers support allow the NDS directory to be partitioned across multiple servers but appear to be a single enterprise directory tree. Managers can replicate the partitions from server to server to improve performance and availability. Users and administrators can access the enterprise directory from any client workstation as long as they have the appropriate rights.

Novell wants to establish NDS as the industry de facto standard for network directory services that can run over NetWare, NT and Unix. The vendor started this initiative by giving away NDS and charging for support.



Michael Simpson, Novell's director of directory services in Provo, Utah, says, "We are in the business of commoditizing directory services because our business is directory-based services — things that are built on top of the directory, just

like the NOS was dependent upon a physical network being there." One example of a directory-based service, he says, is Novell's new BorderManager firewall suite.

Novell is bundling NDS with key operating systems and has already forged relationships with The Santa Cruz Operation, Inc. and IBM. In addition, Novell will bundle NDS with every HP-UX box sold by Hewlett-Packard Co. starting later this year. It also has signed an agreement to put NDS on top of Solaris. A bundling announcement with Fujitsu Ltd. is pending, and

Microsoft's Active Directory Services may lighten your load

If you're tired of trekking from server to server to administer Windows NT domains, Microsoft Corp.'s Active Directory Services (ADS) promises to give you a break. ADS, to be embedded in the Windows NT 5.0 operating system, will provide a single point of administration across the enterprise, single network logon to any network service and directory integration for server applications.

It also will provide a central repository for most NT administrative information. For example, it will contain records of the "junction points" that tie together Microsoft's Distributed File System across multiple servers and volumes. And it will lead to better security, acting as a central resource for storing individual user IDs, access controls, public-key and Kerberos cryptographic information.

This new centralized approach is made possible by ADS' hierarchical data model, or schema, which is based on Lightweight Directory Access Protocol's (LDAP) X.500 tree and Domain Name System (DNS) domains. This also allows for support of multimaster replication, meaning changes to any part of the directory can be made on any server, subject only to the administrator's access rights.

All of that makes ADS very different from the NT 3 and 4 Security Access Manager, which it replaces. Today, NT domains contain many accounts existing in a flat namespace. Domain-to-domain trust has to be configured on a case-by-case basis, while groups and users have to be defined in multiple domains to enable information sharing — a laborious process.

With ADS, the enterprise is a hierarchy of domains, each with an X.500 and DNS name. Domain controllers authenticate each other through Kerberos, so there's no need to manually define trust relationships; trust will be built in. Administrators will create user entries, group entries and access controls just once for the entire enterprise.

ADS' native protocols will be LDAP and DNS, and Microsoft's programmatic interface to the directory is called Active Directory Service Interface (ADSI). ADSI embeds support for the standard LDAP C language API, but also supports ActiveX object interfaces. Additionally, Microsoft will build ADSI into VBScript.



That gives developers lots of options for writing applications and other tools that can tie into ADS. Microsoft says several vendors already are writing applications to ADSI, including QuerySoft, NetVision, Inc. and NetMagic Systems, Inc.

ADSI, working with LDAP, also will provide multivendor client-to-directory interoperability. Once an application issues ADSI calls to look up or manipulate directory entries, Microsoft drivers built into Windows NT will enable access to information not only in ADS but also in other LDAP-based directories, and various older directories, such as NT 3, NT 4, and NetWare 3 and 4.

However, in a recent change of positioning, Microsoft is not implementing the full X.500 standards for directory-to-directory interoperability. Instead, Microsoft's server-to-server protocols, replication and access controls will be proprietary. That means Microsoft won't be providing a fully transparent way to manage networks with a mix of directories, such as ADS and Novell, Inc.'s Novell Directory Services (NDS). To do that, you'll need a third-party metadirectory offering.

Support for the LDAP/X.500 information model also means applications can install new data types in the directory. These could be new attributes in existing user entries or entirely new objects. For example, word processors, browsers, e-mail front ends or other applications needing to store user preferences in the directory will be able to easily create a new property, or attribute, in the ADS schema at the time of their installation.

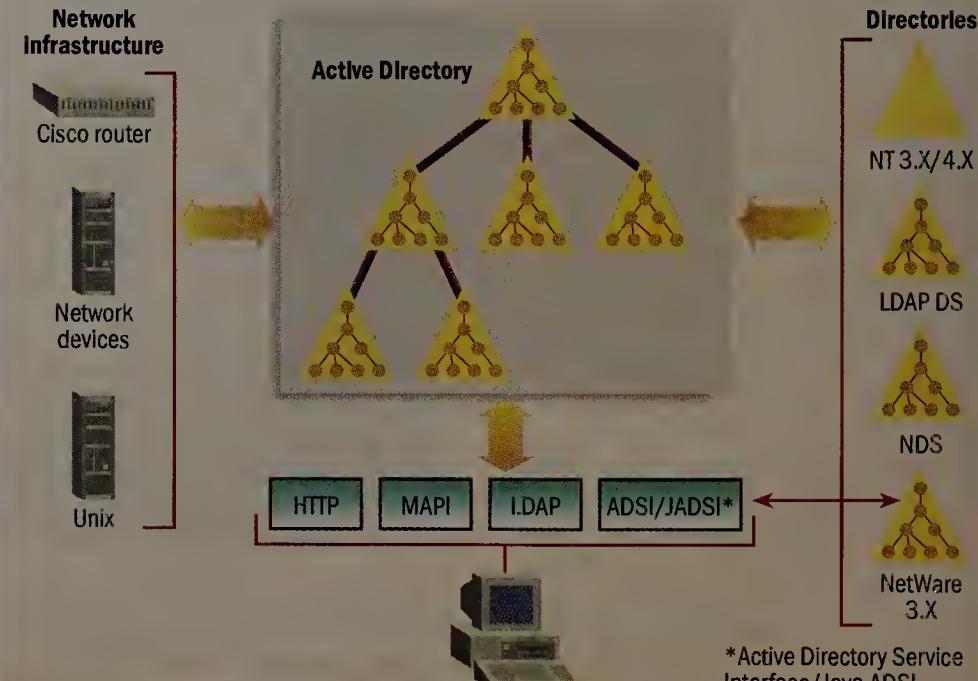
To migrate from existing versions of NT, you'll first have to move the data from NT 3 and 4 servers into ADS and upgrade the domain controllers to NT 5 one domain at a time. Then you can link all the domains

and their controllers into NT's new enterprise directory structure. After that, Microsoft says ADS will still be backward-compatible with earlier versions of Windows NT Server, providing complete emulation of the Windows NT 3.5X and 4.0 directory services and administrative tools. Also, applications written to the Win32(r) API will continue to work unmodified in ADS environments. Microsoft application directories — such as the Exchange servers — can be moved into the ADS using a migration tool.

Another important ADS feature is support for end-user searching and navigation of the directory. Users will be able to browse the logical network, for example, to find all color printers in Building 10. Administrators will be able to distribute shortcuts to resource entries,

HOW ACTIVE DIRECTORY SERVICES PROVIDES INTEROPERABILITY

Microsoft Active Directory Services will use LDAP and ADSI to provide access to information contained in other directories.



*Active Directory Service Interface/Java ADSI

containers or saved searches to an entire site, and/or build global "yellow pages" catalogs of resources.

Of course, you won't be able to do any of this until NT 5.0 ships. Microsoft isn't committing to a specific date, but expects NT 5.0 will be out in the first half of 1998.

— Gary Rowe and Daniel Blum

Enterprise directory investments pay off

Novell has inked a deal with Oracle Corp. to integrate NDS into Oracle databases on the aforementioned platforms, which represent 77% of all shipping Unix servers, according to Novell. This will let mixed NetWare and Unix environments support single logon and reduce administration costs. NDS/NetWare users will be preauthenticated for Oracle database access, and NDS-defined groups can be configured to access specific Oracle databases.

This is accomplished by NWAdmin, which will track an Oracle object and control it the same as it would any other NDS object.

Novell will port NDS to NT with the release of NDS for NT, scheduled to ship by year-end. Native NT support is important because it enables NDS to directly support Oracle and other NT-based applications, such as Microsoft Exchange and SQL Server.

And on the Internet front, Novell will integrate NDS with Netscape Communications Corp.'s SuiteSpot servers and expects to be the first to support the Java Naming and Directory Interface. It also plans to support integration with Microsoft's ADS when it becomes available.

NDS will transform into a true NOS-independent intranet directory when Novell releases its Java-based management console, code-named Houston, in the first half of 1998.

Tying it all together

Chances are, you'll end up with a mix of NT and IntranetWare LANs. There are some tools that facilitate their coexistence from a directory perspective.

Microsoft's Client and Gateway Services for NetWare utility was upgraded with NT 4.0 to support browsing of NDS resources, NDS authentication and NDS printing. The vendor also offers Directory Service Manager for NetWare, a tool that provides some central management of NetWare servers using the Windows NT Directory Service. However, this facility only works with the NetWare bindery — that is, NetWare 2.X and 3.X.

Although it offers far less interoperability than the forthcoming NDS for NT port, Novell Administrator for NT tool extends NDS-based administration services to the NT domain and provides a migration path to NDS. Novell Administrator for NetWare is a snap-in for NWAdmin that allows NetWare administrators to centrally manage NT users and groups. The product also includes an integration utility that makes NDS the master repository for all NT SAM user and group information.

Novell's and Microsoft's interoperability products are limited, but provide some cross-vendor integration. The key problem is they both require the prime owner of information to be their respective directory services.

This creates challenges in scalability, management, access control, replication and data integrity when large populations of NDS and NT Directory

Go online for more about enterprise and metadirectories, including tips on constructing them.

www.nwfusion.com



If your chief information officer asks how much an enterprise directory costs, explain that the real question is can you afford to go without one.

That's really the better question because it's difficult to determine the real cost of a directory, especially because they tend to be bundled with an application. Plus, the bulk of the cost of owning a directory stems from support; the costs associated with training, setup, configuration and administration can be quite substantial.

But the opportunity costs are easier to grasp. That is, what would it cost if you didn't have effective directories? When the enterprise or a business unit needs a new application, chances are that application needs a directory for routing, security, groups and other functions. The manual effort required to support that directory interferes with deploying that application. Opportunities may be lost because there simply isn't enough time or money to deploy the applications.

Invalid or out-of-date directory information creates hidden costs, too. If users can't find each other in the directory, they can't communicate, resulting in reduced productivity. Lost messages lead to misunderstandings, new employees can't access required systems, and security risks are incurred when someone leaves the company but his or her logon ID remains.

A directory infrastructure that allows a single point of administration for all applications, training, setup, configuration and administration will reduce costs overall. It will be easier to "directory-enable" new applications. Information is more likely to be valid and up to date. With every new application that leverages the directory infrastructure,

Services objects are present. Suppose, for example, a company has two large operating units that use NDS and ADS. Neither operating unit wants to be the subservient directory that passes primary administrative responsibility to the other. Global directory changes can't be easily implemented, nor is all data accessible across the directory environments.

If your environment is primarily based on NT or NetWare, then Microsoft or Novell's integration products will work, but if you have large populations of both NOSes, these tools aren't the best solution. Instead, look to a number of third-party solutions that leverage NDS and NT directory services.

For instance, a small company called NetVision, Inc. makes a product called Synchronicity for NT Server 1.1. Synchronicity includes an agent that runs on an NT Server, a NetWare Loadable Module for NetWare and a snap-in for NWAdmin. The net result is a product that supports NT and NDS users. It provides synchronization support for NDS, NT (SAM), Lotus Development Corp.'s Notes Name and Address Book and the NetWare 3.X bindery.

Synchronicity allows an administrator to change, add or delete NT users or groups from the standard Novell NWAdmin utility using NDS



the cost savings increase.

Manageable, consolidated directories also offer enterprises a golden opportunity to reduce desktop maintenance costs by storing configuration items that might otherwise need to be held in PC-based files, scripts or registries. When such information is held in the directory, changes need only be made once. When information is filed in the PC, the updating burden is costly.

To get the actual numbers in your company, you'll need to inventory existing systems, survey employees, and talk to other corporate teams charged with reducing overall desktop cost of ownership and deploying new applications. Quantify the costs of maintaining and administering all your existing directories, and project the reduction in these costs as you begin to consolidate around a network operating system (NOS) or metadirectory. Input some per-employee savings for reduced PC configuration and increased productivity, and take credit for some of the benefits that breakthrough directory-enabled applications can bring.

Finally, subtract the cost of your planned NOS or metadirectory hardware, software and projected administration to get an estimated return on investment.

In a typical Fortune 1000 corporation, a consolidated enterprise directory, could save anywhere from \$10 million to several hundred million dollars over a five-year period.

This includes reductions in quantifiable personnel costs, network costs and redundant administration and development costs, as well as opportunity costs, productivity gains, desktop maintenance cost reductions and benefits from breakthrough directory-enabled applications.

— Gary Rowe and Daniel Blum

as the central repository.

Chad Latimer, NetVision's vice president of sales, says Synchronicity's bidirectional support sets it apart from Microsoft's and Novell's offerings and allows updates to originate on NT or NDS. Key Synchronicity users include Chase Manhattan Corp., Rolex and Knight-Ridder Information, Inc.

Banyan Systems, Inc. is another NOS directory player that has been following a strategy similar to Novell's in championing its Universal StreetTalk directory. StreetTalk for Windows NT can help with the cross-system management of StreetTalk and NT directories.

Netscape has done the most to proactively implement LDAP and other Internet standards for directories. Netscape views the NOS and NDS directories as obsolete concepts that will be supplanted by intranets and LDAP-based directory services. Netscape's LDAP-based Directory Server and Certificate Server products integrate the management of all its SuiteSpot servers, and this consistency is of considerable benefit to heavy Netscape users. However, there's still a lot of "obsolete" NOS infrastructure around that isn't owned by Netscape. In fact, Netscape isn't positioning itself as a metadirectory vendor that can work with legacy environments. And while

SPECIAL SECTION: DIRECTORY DIRECTIONS

Netscape may become an important player in corporate directory environments, it usually won't assume the enterprise directory function.

But vendors such as Zoomit Corp. are offering metadirectory and network management products that leverage multiple directories, integrate them to achieve interoperability or consolidate them into a single repository (see story at right).

Net management directories

Network management products also can use or provide directory services. Enterprise management vendors such as Computer Associates



3Com Corp. plans to build network control software into end systems and routers that will query LDAP directories for access control and policy rulings covering authentication, prioritization and bandwidth reservation.

3Com's TranscendWare will offer tools to set network security policy.

TranscendWare will be designed to work with the Microsoft/Cisco schema or to install schema dynamically using advanced LDAP Version 3 capabilities when they are available. Lionel Gibbons, director of TranscendWare product management in San Diego, says, "We don't dictate to our customers what they have to put in their network, we mean to work with all of them."

While initial efforts may look remedial, the path being carved by 3Com, Cisco, Microsoft and others is heading in the right direction. The directory will serve as the matchmaker between users, machines, applications and the network. IP addresses issued by Dynamic Host Configuration Protocol servers, user IDs issued by administrators, and resources available to users and applications will all be stored in the same repository. In the world of fully network-enabled computing, the user will not need

Metadirectories are the kings of consolidation

Metadirectories are the United Nations of directories — they serve to unify disparate network operating systems (NOS) and application directories so all can peacefully coexist. Metadirectories are products that combine Lightweight Directory Access Protocol support and an X.500-like schema (or information structure) with rich, proprietary consolidation functions.

Central to the metadirectory concept is the ability to join relevant data from different directory inputs into a single object. For example, a metadirectory could integrate user information from a human resources application directory, NOS directory, telephone directory and five separate e-mail addresses into a single object called "Gary Rowe."

Metadirectories often can selectively filter which entries are included, enable access controls and provide bidirectional attribute flow between different source directories.

These products provide one of the only ways to achieve enterprise directory services before a fully adopted standard emerges. Early implementations include

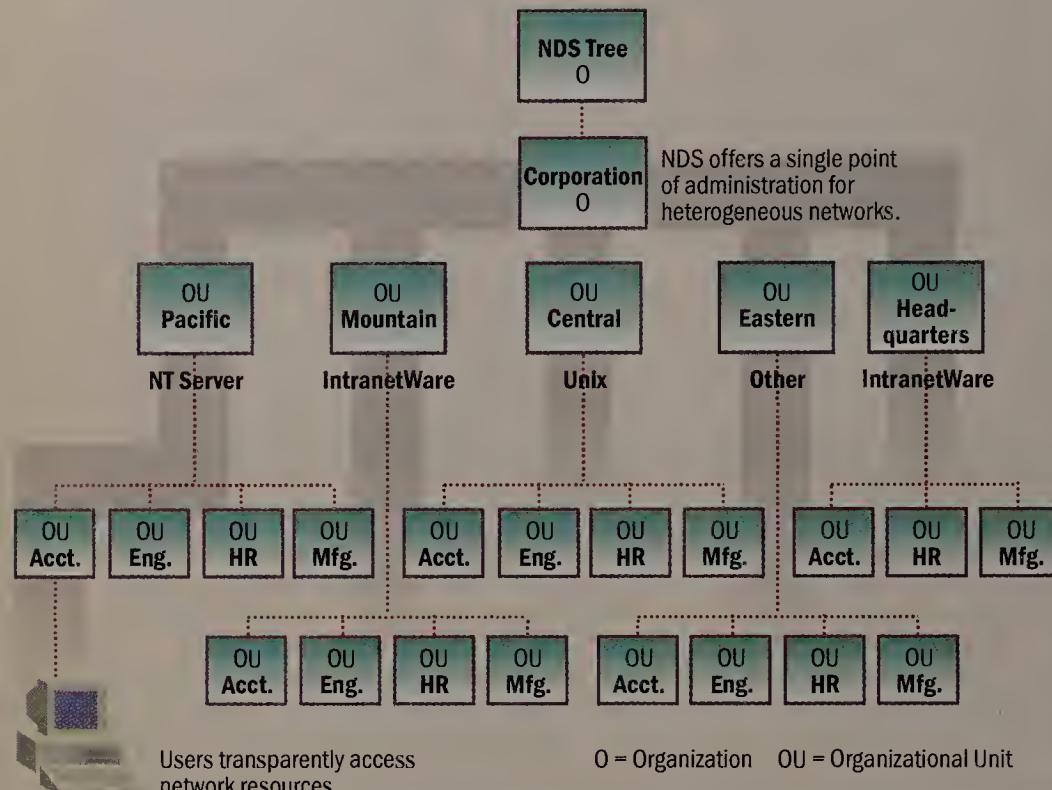
Control Data Systems, Inc.'s Rialto Global Directory/Meta Edition, Isocor's Global Directory Server, NetVision, Inc.'s Synchronicity for NT Server, WorldTalk Corp.'s NetTalk and Zoomit Corp.'s VIA. Zoomit's product offers far more functionality than other metadirectories, but NetVision has the longest track record in solving the problem of integrating NT and Novell Directory Services (NDS). Expect many other vendors to enter this market next year.

Metadirectories will increasingly expand to tightly integrate with NOS directories, while NOS directories such as NDS and Microsoft Corp.'s Active Directory Services are simultaneously expanding to support metadirectory capabilities.

Will the enterprise directory of the future be a NOS-based directory with metadirectory functionality or a separate metadirectory that supports a diversity of operating systems? It's a bit too early to tell, but both groups of vendors appear to be on the right track.

— Gary Rowe and Daniel Blum

HOW NOVELL DIRECTORY SERVICES (NDS) PROVIDES INTEROPERABILITY



International, Inc., plan to fully leverage NDS and NT directories. T.M. Ravi, CA's vice president of marketing, describes the directory as "the key repository for critical information to be managed by our Unicenter TNG offering."

While Unicenter TNG is CA's flagship end-to-end management product, its Cheyenne division product, DS Standard, provides the view into NDS today and ADS in the future. DS Standard for Windows NT provides snapshots of NT directories that can be used to model mass changes, support disaster recovery or verify the tree structure. It also will be compatible with NDS.

Systems management giant Tivoli Systems, Inc., also is jumping into the cross-NOS arena. The Tivoli Management Environment (TME) platform for NT can manage Windows NT registry, NDS and Unix accounts from a single console. It also integrates the management of user information from Oracle, Sybase, Inc., SQL Server and Informix Software, Inc. databases.

Watch for increasing integration between the foundation network vendors and the NOS directory. This trend was recently brought to light by the strategic agreement between Microsoft and Cisco Systems, Inc. Microsoft will extend the ADS schema to accommodate the network components supported by Cisco. The vendors also have agreed upon a replication scheme, and Cisco plans to port ADS to Unix environments.

to know where network services are before assessing them or what's going on behind the scenes to make it all happen.

How to proceed

OK, so how do you get to this directory nirvana? Your best choices will be determined by your network enterprise strategy.

NT users face multiple dilemmas. Implementing NT domains is administratively expensive, but the only alternatives are to deploy a third-party product or hold off on heavy-duty intranet building until NDS for NT or ADS arrive.

NDS is becoming an enterprise-level NOS-based directory and it will run on NT well before ADS is available. Its strong, mature and user-friendly X.500-like hierarchical structure supports multiple object types and attributes. But many NetWare users need NT as an application server, and NDS for NT is unproven. In addition, some users who have not yet migrated to NDS are concerned about the business risks of gambling on Novell given the vendor's recent profitability problems.

While ADS promises to combine much of the functionality of NDS with the marketing power and leverage only Microsoft can provide, those with an immediate need shouldn't bank on an undelivered product. Microsoft hasn't announced a release date; even after it does, remember the

company is prone to schedule slips.

You won't be able to deploy ADS without also rolling out all of NT 5.0., says Martin Waterhouse, senior directory technologist at Chevron Corp. in San Ramon, Calif. "We're not as bullish about Microsoft Active Directory [Services] as Microsoft *Continued on page 52*



SOFTARC'S FIRSTCLASS INTRANET SERVER OFFERS
POPULAR MESSAGING AND COMMUNICATIONS FEATURES.

FirstClass Intranet Server feels more like coach

By Steven Goldberg

For a messaging system with more than five million users, SoftArc, Inc.'s FirstClass is a well-kept secret — perhaps because the bulk of those clients are Macintoshes. Last month, the company released FirstClass Intranet Server (FCIS), which supports not only Post Office Protocol 3 (POP3) and Simple Mail Transfer Protocol messaging, but also standard Internet protocols. We found its confusing interface design and awkward administration keep it from being world-class.

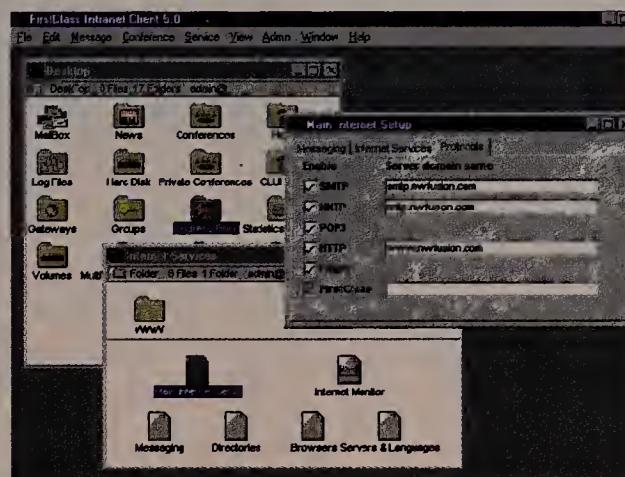
FCIS's main appeal is its breadth of services. Out of the box, the software can be used for e-mail, group conferencing, document management, HTML publishing, forms creation and routing, and other functions. FCIS also supports direct-dial server access with passthrough to file services. While this may be appealing for small companies, enterprises are likely to implement a generic PPP dial-in service.

E-mail and conferencing

We tested FCIS on a Windows NT server. The product also runs under MacOS.

FCIS ships with a proprietary e-mail client that uses not POP3 but the company's proprietary Firewall Control Protocol — an odd choice in this age of open standards. The client application, which takes up the entire screen, is usable, but its interface is confusing. For example, context-sensitive choices are available by clicking the right mouse button, but a click in an open conference yields a staggering 27 choices.

In addition to sending messages, you also have to use the e-mail client to administer the server. If you log on as administrator, or a user with administrator privileges, the client presents additional management menu items. This can't be



A view from the top — The administrator's desktop provides access to all FCIS functionality.

the best way to administer a server-based application, but it's the only way FirstClass provides.

The FirstClass desktop is the point of entry to all FCIS functions. Split into two panes, one section lists available services (mailbox, news, home page and others), while the other lists the documents available under the selected service.

The FCIS administrator manages the contents of user desktops, individually or by group. You must manually enter users and groups, even if

you already have them defined under Novell, Inc.'s Novell Directory Services or Microsoft Corp.'s Windows NT domains.

As an option, the administrator can create a service that provides access to local file services on the server. So for the remote user, FCIS could serve as the single point of entry for e-mail and file server access.

A particularly nice feature of the client is its ability to work offline, allowing access to e-mail and conferences while not attached to the network. Working in offline mode starts a separate process on the workstation, FirstClass Personal, responsible for queuing FirstClass additions and deletions. When connecting to the FCIS, via LAN or dial-up, FirstClass Personal synchronizes any changes via its replication engine.

Replication can be initiated manually or scheduled. The FirstClass Personal window is a simple text interface that displays relevant actions, but it is not much help to a user looking to perform basic troubleshooting for a replication session.

After you get comfortable with FirstClass e-mail, participating in conferences is a breeze. You create a topic or response through the e-mail interface by addressing the "to" field to the conference. A conference window has a familiar threaded look: main documents at the top, with responses indented below. An administrator has a range of privileges to grant conference participants, ensuring privacy where appropriate.

Drag-and-drop Internet

FirstClass has implemented Internet/intranet support in a consistent, straightforward manner. After setting up the FirstClass basics, we intranet-enabled our post office by selecting all the available protocols: HTTP, POP3, SMTP, Network News Transfer Protocol and File Transfer Protocol.

Once the protocols are enabled, a separate intranet process runs in the background to service requests, and the software creates a special folder called WWW on the administrator's desktop. Any FirstClass object can be copied into the WWW folder. The content then is automatically "published" for intranet consumption, where users can access it via a Web browser or POP3 e-mail client.

We tried using Qualcomm, Inc.'s Eudora Light POP3 e-mail client to read a FirstClass mailbox, and everything worked as advertised. The biggest drawback is the limitation of the

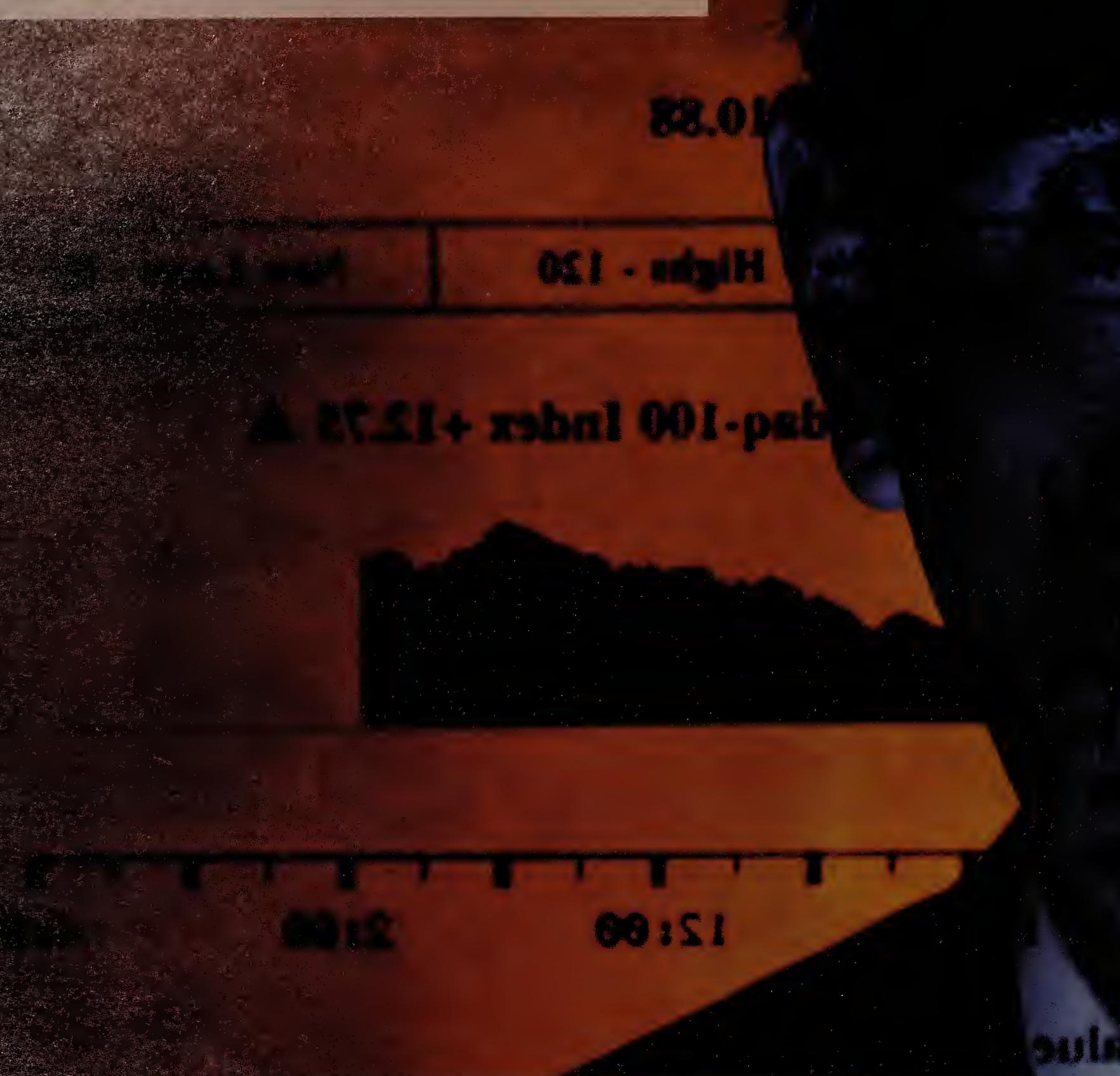
See Review, page 52

Score Card

	Management/ administration (30%)	Networking/ connectivity options (20%)	Performance (10%)	Security (10%)	Enterprise scalability (10%)	User interface (10%)	Installation (5%)	Documentation (5%)	Total score
FirstClass	5 x .30 = 1.5	9 x .20 = 1.8	6 x .10 = 0.6	7 x .10 = 0.7	7 x .10 = 0.7	6 x .10 = 0.6	7 x .05 = 0.35	6 x .05 = 0.3	6.6

Individual category scores are based on a scale of 1-10. Percentages are the weight given each category in determining the total score.

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FEATURES

Continued from page 48

would want us to be. To move to ADS we would need to have a new supporting infrastructure." Chevron, a major Microsoft NT and Exchange user, is piloting a metadirectory from Control Data Systems, Inc.

"ADS is very interesting, but we won't move from NDS for at least two years," says John Osterman, director of networking technology at BankBoston, N.A.

Despite these cautions, ADS and Microsoft's developer following will make a big impact. ADS may or may not have a future as your enterprise directory, but the odds are it will become an important part of your environment. Be sure to earmark part of your budget for evaluating and testing ADS once the NT 5.0 beta is available.

If you have a strategic commitment to Novell, finish deploying NDS throughout your NetWare environment, pilot Novell's Administrator for NT and be prepared to test-drive NDS for NT once it's available. Use Synchronicity or a similar product to ease the short-term pain, if necessary.

If your company wants to aggressively integrate e-mail, NOS and human resources applications through LDAP, consider a metadirectory product from Control Data Systems, WorldTalk Corp. or Zoomit Corp.

Durwin Sharp, electronic commerce adviser at Exxon Corp. in Houston, characterizes metadirectories as the "bridge to provide NT 5 directories in the current environment." Exxon has a growing base of NT systems and multiple legacy directory environments. Although the company is moving toward metadirectories, Sharp also says "Microsoft's ADS will clearly be a part of anyone's directory that has a major NT server component."

Pumping new resources across the enterprise

Directories are the lifeblood of network operating system (NOS) administration and management, but they'll need a transfusion in order to span the enterprise and all of its applications.

NOS directory view and update functions are integrated with the server's active management services. For example, when an administrator creates an account, the directory gets updated at the same time the user's home directory and other server objects associated with that user are created. And when users examine a printer in the directory, they can access the print queue and manipulate print jobs. These are core functions of a basic NOS directory.

But to become a full-fledged enterprise directory, NOS directories must span multiple NOS servers to facilitate single network logon and a single point of administration. Directories also must support multiple, flexible fields or properties and allow applications to add new properties to the schema at install time. For example, groupware/workflow applications might need to store role-based information, or a security application might need to store badge IDs.

As enterprises drive toward decreasing the enormous cost of per-user PC administration and configuration, even common applications such as word processors will begin to store information about per-user preferences in the directory. Allowing applications to use the enterprise directory in a flexible way is critical to cost-effective enterprise application deployment.

Standards support also is critical. An enterprise directory needs to support standards such as Lightweight Directory Access Protocol (LDAP), Domain Name System, Java, SNMP, TCP/IP, and Dynamic Host Configuration Protocol. These standards increasingly will allow any application or utility to plug into any NOS directory, eliminating proprietary addressing and configuration dependencies.

But don't expect standards to solve all your directory problems yet, if ever. Although LDAP supports multivendor client-to-directory access, full multivendor directory-to-directory interoperability requires protocols for distributed queries, distributed updates, access control, replication and management. The full international X.500 standard provides many of these, but Microsoft Corp., Netscape Communications Corp., Novell, Inc. and many other vendors have essentially written it off. They've decided instead to wait for the Internet Engineering Task Force to build simpler directory-to-directory protocols into LDAP, a process that will take several years.

If your goal is to manage mainframe-based application and client/server Unix applications along with the NOS, then consider using Tivoli's TME.

Whatever product you choose, plan on sticking with it for a few years. While ADS and other products will have LDAP and an X.500 schema

in common, there will still be significant migration issues to address.

Rowe and Blum are principals at Rapport Communication, Inc., an industry consulting company specializing in directories, messaging and groupware. They can be contacted at www.rapport.com.

REVIEW

Continued from page 49

POP3 protocol, which is inherently client-based. E-mail transfer is a download-only transaction, rather than a client-server replication scenario. Once you download e-mail to the client it is not possible to resynchronize with a server. The successor to POP3, Internet Message Access Protocol 4, remedies this situation somewhat, but FirstClass doesn't yet support it.

We also were able to use Microsoft's Internet Explorer to view and create FirstClass content, including conferences, newsgroups and mailboxes. FirstClass is not intended to be an intranet content design system, rather it is meant for publishing only. We used Microsoft Word 97 to create an HTML page and were easily able to publish the content with FirstClass. The administrator can delegate content-publishing authority easily using FirstClass' comprehensive permission controls.

Installation and admin

Installing FCIS is a no-brainer. Within 5 minutes, we had installed the software and were logged on as the administrator. All administrator functions are performed through the stan-

dard FirstClass Intranet Client, eliminating the need for a separate management interface. As the administrator, we could create users and conferences, design new forms and enable which protocols would be active on the server.

FCIS doesn't provide any high-level integration with Windows NT or Mac OS (in that version of the server). Valid NT domain users are separate and distinct from FCIS users, meaning you can't take advantage of all the work you've already done setting up users for the network operating system. Creating a user is fairly easy, although all FCIS tasks seem to take too many steps. User creation and deletion can be automated using an e-mail-based batch administration utility.

The software uses a proprietary security structure rather than public-key encryption.



For a third-party resource page for FirstClass, go to Network World Fusion

www.nwfusion.com

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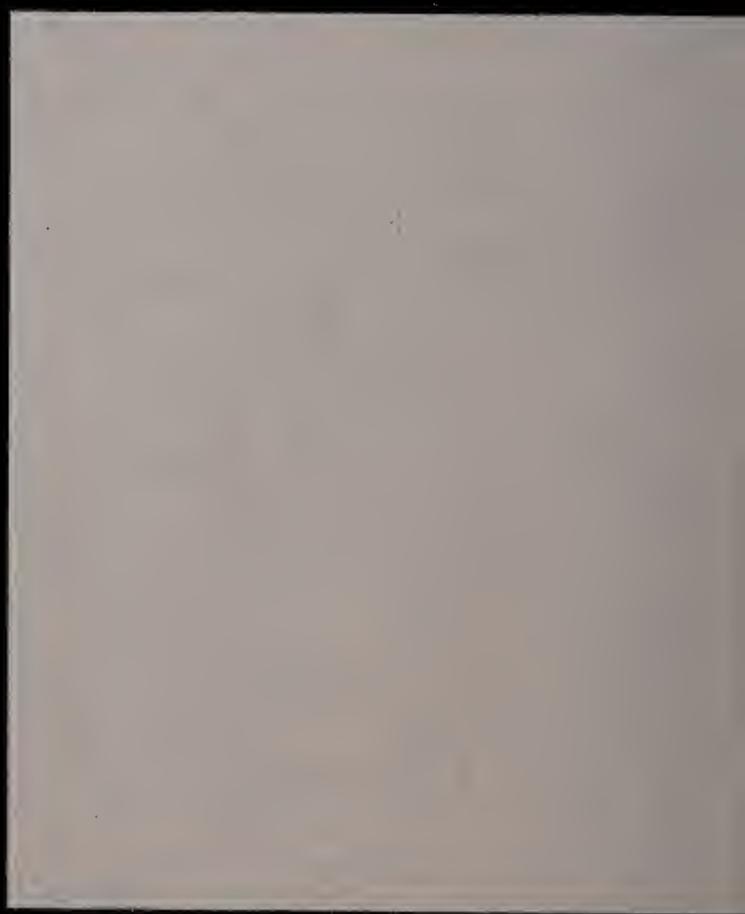
CONS

- ▼ Confusing user interface requires too many keystrokes
- ▼ Does not synchronize with any network user database, requiring separate processes for user management

Summing up

We found FirstClass to be a good entry-level e-mail system, although its interface was unnecessarily confusing. Perhaps because of its origins as a Macintosh mail server, it resembles a legacy application that has new intranet features, rather than software explicitly designed to exploit open technologies. That said, FirstClass is easy to set up and has some useful features. Enterprises looking for a messaging and intranet platform should still look at Lotus Notes or Microsoft Exchange, but FirstClass has a place among small to midsize companies.

Goldberg is a manager for a financial services firm focusing on the design and implementation of client/server technologies. He can be reached at sgoldberg@pobox.com.



Management Strategies

Online recruiting: Snaring prospects in your Web

Used strategically, the Internet can reduce your recruitment costs and bring in highly qualified applicants.

By Tom Duffy

The Internet has been a recruiting gold mine for Bruce Hatz, a corporate staffing manager at Hewlett-Packard Co. in Palo Alto, Calif.

Before HP started advertising positions on its Web site, the company primarily relied on recruiters and advertisements in major daily newspapers to attract applicants. While recruiters often came up with qualified candidates, newspaper ads were far less effective: Roughly 90% of the applicants were vastly underqualified.

All that changed with the advent of online recruiting.

"I'm finding that the volume of resumes we get is much lower on the Web than we estimated, and the applicants are far better matches," Hatz says. "One out of four resumes is sent directly to a hiring manager for review, as opposed to one out of 10 when we were going through the newspapers."

The benefits of online recruiting are clear. By curtailing newspaper advertising and reducing the number of nuisance resumes, Hatz says HP has cut its recruiting costs in half, from \$7,000 to \$10,000 per position to \$3,500 to \$5,000. That's a huge savings for a firm that fills thousands of positions every year.

HP's Web site gets an estimated two million hits per day, making it a powerful recruiting tool. But not every company has such a high-profile Web site at its disposal.

For those that don't, there are a host of third-party career-oriented sites that give job seekers the opportunity to find and apply for jobs online. These include CareerMosaic, Espan, Hot Jobs, The Monster Board and Online Career Center.

Firms such as HP mainly use external sites to advertise their companies and to draw potential recruits to their own sites. But other businesses post most of their job openings externally.

That's the approach taken by Axent Technologies, Inc., a database security and encryption software vendor in Rockville, Md. Axent posts positions



on several online sites and points people to its own Web site to learn more about the company. Axent continues to use newspaper ads but often does not provide a mailing address, instead directing job candidates to its Web site.

Candidates who complete the process seem better qualified and better informed about the company, says John Sharkey, a human resources recruiter at Axent.

Bob Mhoon, a recruiter based in Arlington, Texas, says the more companies can do to drive candidates to their own Web sites, the better their recruitment processes will work. Once there, candidates can get a better feel for company culture and learn about the business. Most importantly, it's a great opportunity to explain to candidates in detail what information to include on their resumes and how to submit them.

"Not only does it ensure that you get the information you want about an individual, it also ensures that you receive it in a format that is compatible

with your internal systems," Mhoon says.

But online recruiting isn't as simple as posting a job on Web sites and waiting for the resumes to arrive.

Chris Griffith, president of the Great Moose Lake Corp. recruiting firm in Scarborough, Maine, points out that companies need to build an infrastructure to handle the electronic flood of applications. He says Internet users expect quick turnaround time, and sluggish handling of resumes can quickly sully a company's reputation.

"Companies can create a very bad image very quickly on the Internet," Griffith says. "If people get no response, it's very easy for word to get out that your company has a lot of openings but that nobody ever responds when you send a resume."

Recruitment specialists note that the Internet and increasing mobility of American workers have somewhat changed the nature of job hunting. They warn firms that many people entertain job offers even if they aren't actively looking for work.

For that reason, Mhoon, who also trains recruiters on effective uses of the Internet, encourages people to do more than simply post jobs on the major sites.

"You can find people in discussions on Usenet, and those people reveal their e-mail addresses," he says. "Some recruiters are finding that the direct e-mail approach is one that really pays off handsomely."

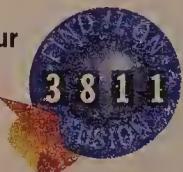
If you approach the search for a candidate like a detective, he says, the direct strategy can be a highly effective way to fill a specific job.

"If there is demand for Informix experts in Dubuque, Iowa, there is probably a way to locate them," Mhoon says.

Duffy is a freelance writer based in Somerville, Mass. He can be reached at tduffy62@compuserve.com.

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Online job searcher had beginner's luck

Charles Redmon advises his wife to be patient when she uses the Internet to search for a job.

"I tell her, 'You have to look at it more as a treasure hunt,'" says Redmon, whose wife Ann is searching for a position in international business management. "You don't strike gold with every swing of the pickax."

Maybe not. But that's exactly what he did.

Until recently, Redmon was an attorney in private practice in Alexandria, Va., who specialized in working with high-tech firms. Late last year, however, he posted his job interests and salary requirements on the CareerBuilder Web site, one of a growing number of sites that attempt to match job candidates with openings. Redmon, 31, says he wasn't aggressively pursuing a job but simply looking for opportunities.

The opportunity for which he was searching came along about a month later, in the form of an e-mail message from the CareerBuilder site. Axent Technologies, Inc., a Rockville, Md., database security and encryption software vendor, was looking for in-house counsel.

After he learned about the opening, he tapped into Axent's Web page. He liked what he saw and, after several interviews, took the job.

Redmon says the Internet was the best way for him to find a job. Just three years out of law school, he says he didn't have enough contacts to find a position through "networking," and he didn't have enough experience to be attractive to recruiters, who typically want candidates who have spent more time in the work force.

"The Internet is a great thing because you are stuck in this interim period where you don't necessarily have a million contacts, but you need to find out where the jobs are," he says. "And some of the search engines produce a tremendous volume of jobs, even though a lot of them aren't

what you are looking for."

Now if his wife can just find a job, the couple will be all set.

"I happen to have struck gold the first time," he says. "But not everybody does, and you can't get frustrated if you don't."

— Tom Duffy



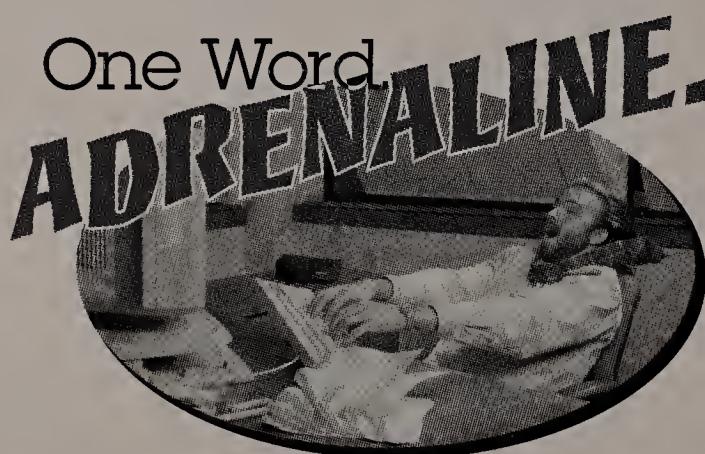
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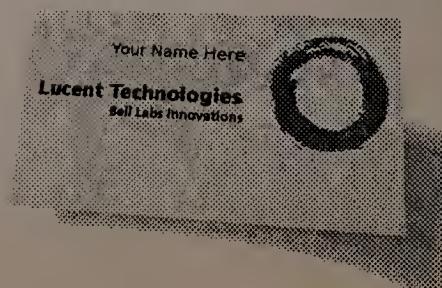
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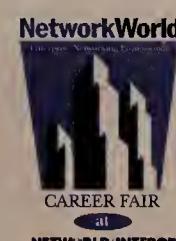
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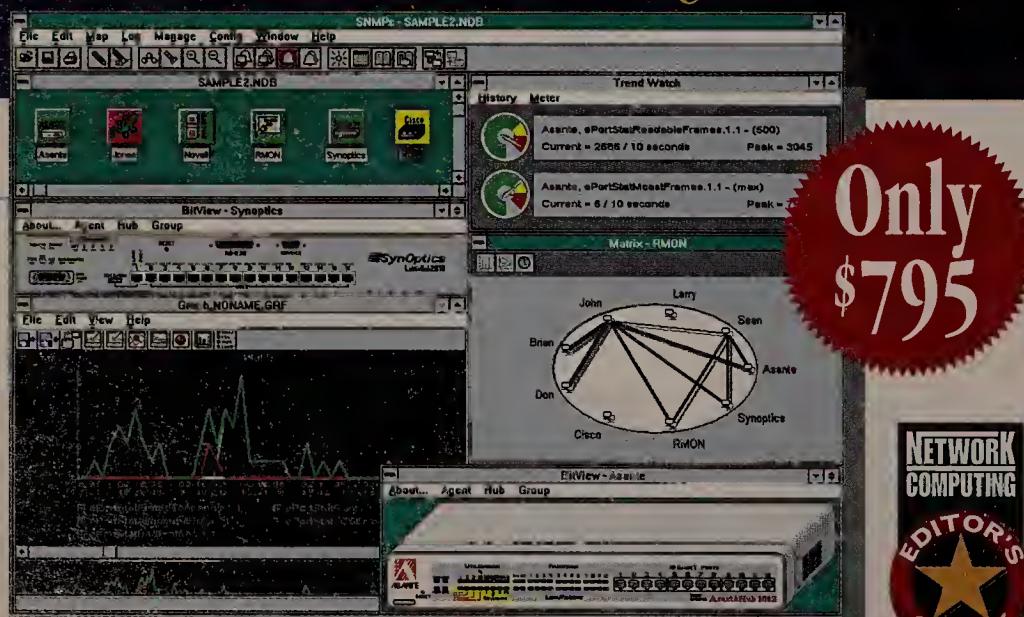
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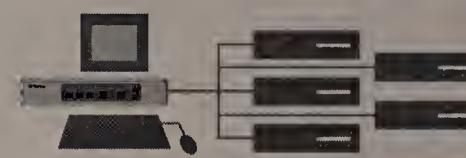
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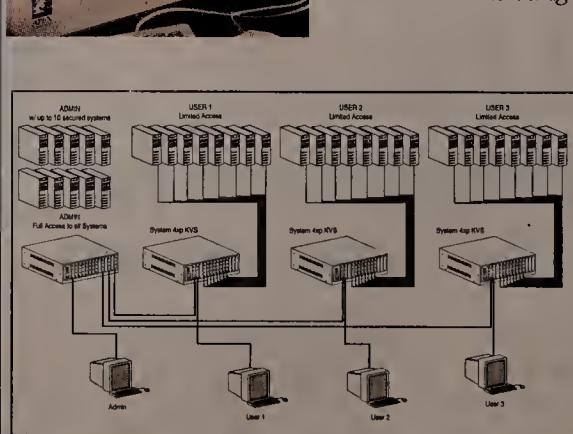
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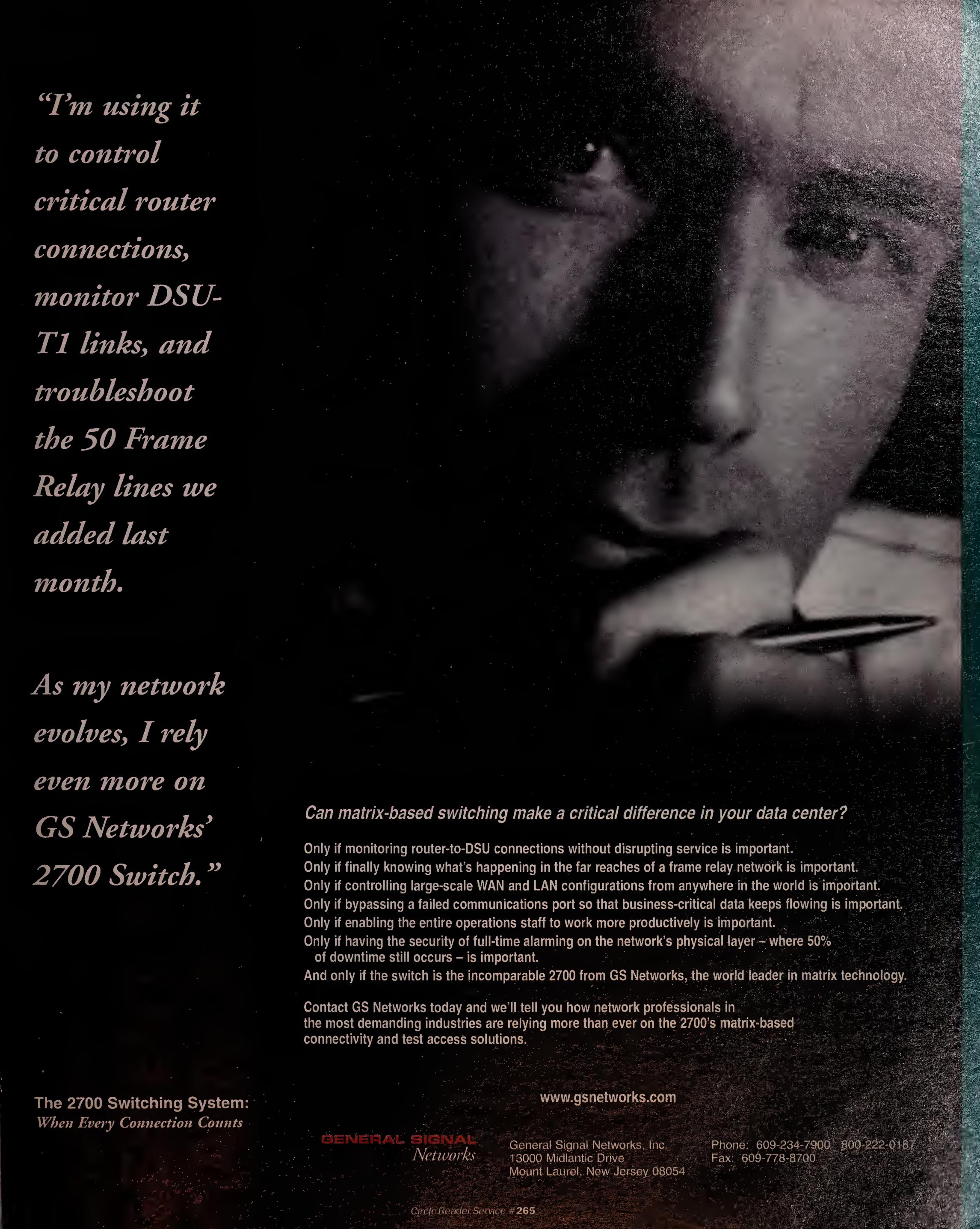
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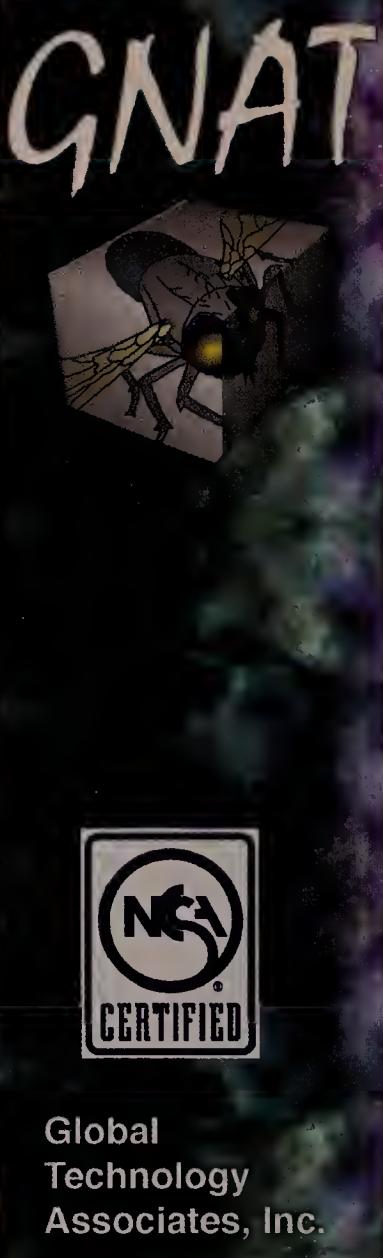
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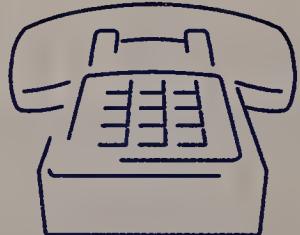
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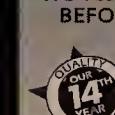
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Cisco

Continued from page 1

-tolerant trunking. The switch costs \$8,995 and is available now. And Bay last week announced a 26-port version of its heralded BayStack 350 that also features fault-tolerant trunking in addition to an aggressive \$269 per-port price.

WHICH MAKES MORE AUTOSENSE?

A comparison of new 10/100 switches from Cisco and Bay Networks

Cisco's Catalyst 2926 supports:
● 24 10M/100M bit/sec ports and two 100Base-TX or 100Base-FX ports
● A forwarding rate of more than 1 million packet/sec
● Up to 16,000 media access control (MAC) addresses
● 1,000 MAC-based virtual LANs
● 400M bit/sec fast/EtherChannel trunking
● Pricing: \$8,995-\$9,995 (\$346-\$384 per port)

Bay's BayStack 350F-HD supports:
● 24 10M/100M bit/sec ports and two 100Base-FX ports
● 1.6 million packet/sec forwarding rate
● 8,192 MAC address capacity
● 8 port-based VLANs
● 800M bit/sec multilink trunking
● Pricing: \$6,995 (\$269 per port)

At the same time, Bay is taking aim at Cisco's switch customers with a BayStack 350 trade-in program.

Prices for 10/100 autosensing switches have plummeted from more than \$1,000 per port to less than \$300 per port in just over a year, thanks to 10/100 autosensing innovator NetICs, Inc., which Bay acquired late last year (NW, Aug. 5, 1996, page 1). Although pricing has come down for everyone, software features and other incentives are needed to entice picky consumers.

Autosensing switches are becoming popular in organizations transitioning from switched 10M bit/sec Ethernet to switched and shared 100M bit/sec Fast Ethernet. Because these switches can automatically sense when to switch at 10M or 100M bit/sec, there is no need to purchase additional hardware to upgrade to Fast Ethernet.

"The market for 10/100 is definitely getting hot," said Dwayne Shirakura, an analyst at Dell'Oro Group in Portola Valley, Calif. "It's causing the straight switched 10M bit/sec and switched 100M bit/sec market to shrink."

Cisco's Catalyst 2926 features 24 switched 10/100 autosensing ports and two 100M bit/sec Fast Ethernet uplinks. It is targeted at workgroup and wiring closet applications that need higher density than Cisco could previously deliver with the 14-port Catalyst 2900.

The fixed-configuration Cata-

lyst 2926 is based on the same 1.2G bit/sec single-bus architecture as Cisco's popular Catalyst 5000 wiring closet and backbone switch. With its 12-port 10/100 or 100M bit/sec Fast Ethernet modules, the Catalyst 5000 can serve as a backbone aggregator of Catalyst 2926 workgroups.

The Catalyst 2926 also runs the same software as the Catalyst 5000. This enables 2926 users to

of 1 million packet/sec, support for up to 16,000 media access control (MAC) addresses and 1,000 VLANs, and dual, redundant power supplies.

The Catalyst 2926 will go straight up against Bay's new 350F-HD, which also features 24 10/100 autosensing ports and two 100M bit/sec uplinks. Like the 2926, the BayStack 350F-HD features a 1.2G bit/sec switch fabric and the ability to forward 1.6 million packet/sec.

But users can configure 800M bit/sec full-duplex trunks out of four BayStack 350F-HD ports using Bay's new multilink trunking software. Cisco's Fast EtherChannel enables only two 100M bit/sec links on the 2926 to be grouped.

Yet the BayStack 350F-HD supports half as many MAC addresses as the 2926 and only eight port-based VLANs.

But the clincher may be the "Cisco Catalyst 5x00 Competitive Trade-in" program. Bay will pay customers \$50 per port to trade in their Cisco Catalyst 5x00 switches when they purchase an equal or greater number of BayStack 350 switch ports.

The program applies to all BayStack 350 switches purchased between Oct. 1 and Dec. 31, 1997.

The BayStack 350F-HD will ship in November and cost \$6,995. ■

Get more information online at www.nwfusion.com.
DocFinder: 3823

Cisco looks to relieve 'Net bottlenecks

In addition to scaling its 10M/100M bit/sec autosensing switches, Cisco Systems, Inc. last week rolled out products designed to help scale the Internet.

Cisco announced the Cisco Cache Engine, a carrier-class, dedicated Internet appliance designed to eliminate repeated transmission of redundant Web content.

The Cisco Cache Engine stores Web pages locally, enabling Internet service providers and private enterprise network users to reduce WAN usage costs by decreasing the number of times traffic is sent over wide-area links. At the same time, Cache Engine will provide enterprise network users and ISP customers with quicker response to Web content requests.

Up to 32 Cache Engines can be combined to form a cache farm for scale and fault tolerance. A fully configured 32-cache engine farm can support up to 500,000 users at a single point of presence and store approximately 25 million Web pages, Cisco said.

Cache Engines also can save bandwidth at Internet backbone network access points, service provider POPs and enterprise central and remote office locations, Cisco said. Once a Cache Engine is populated by an initial Internet content request, subsequent requests for the same Web page are delivered locally.

Caches also are updated frequently according to the time sensitivity of their content. The Cisco Web Cache Control Protocol redirects traffic to the Cache Engine rather than to the originally requested Web server.

The new protocol initially will be supported on Cisco 7200 and 7500 series routers with 10Base-T or 100Base-TX interfaces.

The Cisco Cache Engine, which incorporates Intel Corp.'s Pentium processor, can be configured and managed from any standard Web browser, Cisco said. It costs \$30,000 and will ship in October.

Also shipping at that time will be Cisco's 12000 Gigabit Switch Router (GSR), which debuted earlier this year (NW, May 12, page 6). The 12000 GSR scales up to 60G bit/sec and is targeted at Internet backbones. Pricing for the 12000 GSR starts at \$14,900 for a four-slot configuration and \$24,900 for a 12-slot model.

For more information, contact Cisco at (408) 526-4000.

— Jim Duffy

deploy Cisco's Fast EtherChannel and dynamic virtual LAN configuration capabilities with the new switches.

Fast EtherChannel allows users to configure the two Fast Ethernet uplinks on the 2926 as a 400M bit/sec full-duplex pipe to switches, servers and routers. This enables users to balance traffic loads to server farms and backbone devices.

Other features of the Catalyst 2926 include a forwarding rate

QoS

Continued from page 1

bit/sec for File Transfer Protocol traffic and leave the remaining 10M bit/sec for HTTP traffic (NW, Sept. 8, page 13).

While this service will not guarantee performance across UUNET's network, it does give users more control over the bandwidth they paid for.

T-3 bandwidth is not inexpensive and neither is UUNET's service. The one-time start-up fee for the service is \$23,500, which includes Xedia Corp.'s Access Point 45 and UUNET's installation fees. Users also will have to pay a T-3 port fee to their local service provider that averages around \$5,000 per month.

Tiered T-3 CBQ will be available in a variety of speeds from 3 to 45M bit/sec for \$6,000 to \$54,000 per month, respectively. Burstable T-3 CBQ service also will be available at the same

speeds. This service lets users burst up to the full 45M bit/sec of their T-3 circuits throughout the month and be charged only for the bandwidth they use. Bandwidth is determined by average throughput for the month.

"There is some merit to a service that will let us partition Internet bandwidth," said Ron Kopitowsky, telecommunications director for the New York-based Metropolitan Transportation Authority (MTA). The MTA currently hosts its own Web site with commuter rail and scheduling information that gets 20,000 to 30,000 hits per day, he said.

The MTA is in the process of

giving its employees Internet access over the same pipe that leads outside Web surfers to MTA's site. This is where it may be beneficial to ensure that MTA's employees will be able to access the Web without poor performance because of high traffic at the MTA Web site, he said.

Goldman, Sachs & Co., a UUNET customer, has agreed to beta-test this service. UUNET expects its beta-testing program to begin in the next month with services rolling out in November, a UUNET spokesman said.

This is the first step in UUNET's deployment of CBQ, said Alan Taffel, vice president

of marketing and business development at UUNET. The Internet service provider plans to deploy CBQ technology throughout its network to support end-to-end QoS guarantees in the near future, he said.

Where UUNET has taken the technology route, Sprint has taken the SLA guarantee route to address QoS issues. Effective Monday, all of Sprint's business Internet access and intranet customers will be eligible to sign up for the new SLAs. The guarantees cover net availability, dial-up access and network performance on Sprint's IP backbone, which only applies to its intranet customers, said Andy Livuser, Internet and intranet product manager at Sprint (see graphic).

That guarantee will be extended end-to-end when customers also use MFS Communications for their local access.

Senior Editor David Rohde contributed to this story.

GETTING IT IN WRITING

Sprint's business Internet and intranet access users have a new set of service-level agreements. If any of these guarantees are not met, users will be reimbursed 10% of their monthly port charge.

Guarantee	Internet users	Intranet users
Minimum backbone latency	Not applicable	No greater than 140 msec
Access and backbone availability	99.5%	99.5%
Dial-up access without busy signal	99.0%	99.0%

ACT to attack enterprise network switch market

By Tim Greene
Camarillo, Calif.

ACT Networks, Inc.'s recent acquisition spree is finally bearing fruit.

Later this month the company will roll out two new access switches for customer sites that support voice and a broad range of LAN and WAN protocols.

ACT's SDM-9300 and SDM-9400 will support management of integrated data/voice networks and quality-of-service levels based on switched virtual circuits.

Also, by the end of the year, ACT will roll out a gateway server, ServiceXchange, for carrier networks. It will support interfaces between customer access lines and any of a carrier's service networks: voice, frame

relay, satellite and IP.

The products all fit into a new ACT plan called Universal Access Architecture (UAA) laid out by ACT CEO Martin Shum.

ACT THROUGH THE YEARS

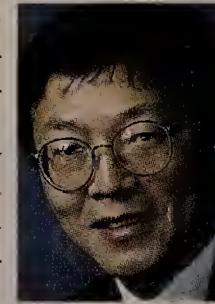
1987	Company founded.
1988	Introduces first voice compression device, the SDM-1.
1990	Airs voice/data TDM mux, SDM-T.
1992	Rolls out voice/data FRAD, SDM-FP.
1995	Unveils SkyFrame satellite FRAD; buys Presticom for \$8.7 million.
1996	Introduces NetPerformer voice/data integrated access gear; buys DeltaComm for \$860,000.
1997	Spends a total of \$15.8 million to buy part of Dynatech and all of Sourcecom.

UAA describes a network supported by ACT access gear that switches voice, LAN and SNA traffic onto dial-up, frame relay or satellite links. UAA also extends into the carrier network, switching traffic among service provider gear. "That kind of flexibility for carriers will ultimately be good for corporate users buying services," said George Hunt, principal WAN analyst for Dataquest, Inc.

ACT is noted for its voice compression and voice over frame relay technology as well as frame relay over satellite gear.

In the past two years, ACT has bought an eclectic mix of companies that have a variety of technologies.

They include a bank-



rupt digital subscriber line hardware vendor, Sourcecom, Inc., a cell relay mux maker, Presticom, Inc. and a piece of packet switch developer, Dynatech Communications, Inc. (see graphic).

With those buys, ACT now has the hardware platform on which to build its carrier-grade gateway, ATM technology for future products and an inroad into carriers to try to sell their prod-

ucts, Shum said.

The initial ServiceXchange gateway will be based on current ACT NetPerformer access switches, but a more scalable version will be ready next year, Shum said.

ACT's switches already help support a voice/data service from Infonet Services Corp. called Integrated Multimedia Service, and will be used to support new Infonet services to be announced later this year (see story below).

©ACT: (805) 388-2474

Infonet targets carrier market

Infonet Services Corp. this fall will challenge long-distance telephone carriers with a worldwide packet-voice phone service designed to save customers 40% on long-distance costs.

The new service, now in beta test in Europe, was described as a "major strategic initiative" of the company by its vice president of marketing, Tom Whidden.

By year-end, customers in the U.S., Europe and Asia will be able to buy the service, an enhancement of Infonet's Integrated Media Services (IMS), which supports voice calls but restricts customers to dialing only locations that are directly linked to Infonet's cell/frame backbone.

The new service would use the Infonet network as the long-distance link in a phone call, and Infonet would switch the call onto the public switched phone network near the destination.

When using IMS, a phone call from San Francisco to Tokyo would cross the Pacific on the Infonet network, but arrive at the phone in Japan via the local telephone company.

Less expensive packet trunks make lower prices possible, the company said.

In addition, Infonet is teaming with Internet service providers to offer high-quality IP voice calls.

Customers would buy the service through their ISPs and initiate Web phone calls via their PCs. Instead of dropping the calls onto the public Internet, the ISP would route them to the nearest Infonet IP gateway. Infonet would terminate the call on the public phone network, which would ring the called party.

Because Infonet controls the use of bandwidth on its network, it can insure that network delay does not interfere with voice quality.

— Tim Greene

Treasury

Continued from page 1

digital content but no royalty taxes to foreign governments. While this could swell U.S. tax coffers, the Treasury's cyberspace tax plan may not bring the same blessings to other countries because the U.S. leads the world in copyrighted Web content and Web merchandising.

"The proposed regulations would say that downloading software in Germany as a single copy is analogous to a sale of goods and only taxable in the U.S.," said Treasury attorney Bruce Cohen, leading the team of experts now finalizing the rules that will be issued by year-end. "In the future, you would not have to pay foreign income tax."

Similarly, a German company such as Software AG would not

pay U.S. tax if a person in the U.S. downloaded a single program from its Web site, he added.

"In a sense, the German tax comes out of the U.S. Treasury," he said.

Though the new rules originally were focused mainly on software sales, the Treasury has decided it will apply the same principles to digitized content.

"We're going to treat all types of content the same," said Cohen, adding that the Treasury still is trying to determine whether some types of digitized content could represent a service rather than goods — an important point because they are taxed differently.

The Treasury's new policy stance, which also applies to the sale of more tangible items such as shrink-wrapped software or CDs, seeks to tackle the thorny problems posed by Internet-

based electronic commerce.

Web storefronts that accept credit cards can easily sell goods internationally. Digitized goods could be downloaded over the 'Net and bypass foreign postal systems and custom points, making it hard for tax authorities to hold the buyer accountable for a tax on the goods.

The U.S. hopes to get support for its tax plan from trading partners in Europe and Asia, but the U.S. may move ahead unilaterally with the rules even if that support is not forthcoming, Cohen said.

In Europe, there is bound to be unease about the plan because the U.S. leads the world in Internet use and the sale of copyrighted works of all kinds.

Largely to counter this perceived American hegemony, European nations have discussed imposing a "bit tax" on all information that Internet users download from abroad. The bit tax would impose a small charge for all data downloaded off the 'Net, whether it was purchased digital content or not. Internet service providers would serve as the toll booths for the European tax authorities, keeping track of how much data customers downloaded.

This plan does not seem to have serious momentum.

But Europe is worried about U.S. predominance on the Internet, said Patrick Vittet-Philippe, advisor for electronic commerce, multimedia content and

business issues at the DG-13 telecommunications division of the European Commission.

"We are at a disadvantage vis-a-vis the U.S. competition," said Vittet-Philippe. "Our worry is to make sure our existing tax base, especially the value-added tax (VAT), is applied to Internet sales." The VAT constitutes about 30% of all taxes collected by the state.

Some U.S.-based companies also are worried about the pending cyberspace tax plan. Roger Cochetti, an IBM attorney, said IBM welcomed the Treasury's effort to remove ambiguity from the current tax law. But he warned that the plan might

encourage some countries to set themselves up as international tax havens for companies trying to avoid the cyberspace tax. ■

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Ira Magaziner, the Clinton administration's Internet adviser, says he is optimistic that the negotiations with other countries for a global cyberspace tax policy will succeed.

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GTE adds T-3 frame relay service

By David Rohde

Irving, Texas

Just because GTE Corp. is pursuing the business-class Internet market via its purchase of BBN Corp. doesn't mean it has forgotten about frame relay.

Far from it. Next month, the local telecom powerhouse will start rolling out a series of frame relay enhancements, including new high-speed ports and a big expansion of its service territory.

GTE officials last week confirmed that they will soon announce a T-3-speed frame relay service to complement GTE's existing T-1 and 56K/64K bit/sec offerings.

GTE GOES FOR THE LOW-PRICED PORTS

Port charges for GTE's new frame relay service in most states:

Port speed	Setup charge	Ongoing monthly charge
56/64K bit/sec	\$95	\$24
1.544K bit/sec	\$395	\$240
45M bit/sec	\$395	\$1,300

The move will coincide with a change in GTE's frame relay pricing structure to include committed information rates (CIR), or presubscribed guaranteed bandwidth, on its frame relay circuits.

Although the changes will make GTE's frame relay service look like most of the long-distance carriers' offerings — with charges for ports, permanent virtual circuits (PVC) and access channels — its prices will be dramatically lower than most interexchange carriers'.

For example, the new T-3 frame relay ports will be priced at \$1,300 per month, which is substantially less than AT&T charges even for T-1 ports.

AT&T charges \$2,200 for T-1 frame relay, and the closest thing it offers to T-3 frame relay — a DS-3 ATM service — runs \$11,000 per month just for the port.

GTE already has offered some T-3 ports on its frame relay switches, but now has filed a tariff for the high-speed service in preparation for its impending announcement.

At the same time, GTE, for the first time, will add a PVC charge based on CIR, which is the speed up to which frames cannot be discarded by the carrier network.

Until now, GTE has been simply setting CIR at a default rate equal to half the port speed and even allowing customers to request additional CIR, all for a nominal fee of \$8 per month for each PVC.

"But customers started to request full, 100% CIR, so we had to educate customers that frame relay is not a full private line," explained Lianne Iwanaga-Ohishi, GTE's senior frame relay product

manager.

Under the new price structure, the \$8 charge will get new users a CIR up to 32K bit/sec, with 64K bit/sec CIR running \$15 a month, 96K bit/sec CIR \$22 a

month, 128K bit/sec CIR \$27 a month and so on.

Existing GTE frame relay customers will be allowed to keep the old PVC pricing for a year while they rewrite their contracts to transition to the new pricing structure.

More significantly for some users, GTE is expanding its frame relay service terri-

tory to include for the first time territories served by the former Continental Telephone Co., better known as Contel before its 1991 purchase by GTE.

As a result, GTE will now offer frame relay in 23 of its 28 states, including a dramatic widening of its territory in some states where it already offered the service. ■

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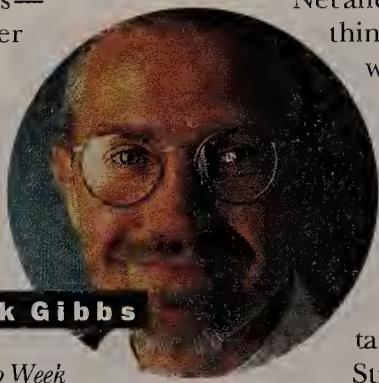
NWW

Searching, feedback and other industry stigmata

Here at the Gibbs Institute of Miracles and Portents it has been a busy, busy week. We're trying to redesign our Web site, www.gibbs.com (I know there's not a lot of design visible to redo, but who asked you anyway?), we're testing some neat devices—the WebZerver from Microtest and the Twister from Compact Devices—and, oh, about a hundred other things.

So as our heads leadenly hit the pillows and Sweet Lethe o'er comes us, we have just enough time for musing on the industry stigmata we've witnessed.

Mark Gibbs



Stigma #1: Apparently, the magazine *Web Week* has never published an article on intranets. Or Java. Now this isn't because I can't follow the instructions on its InfoCaché search page. They are pretty simple.

The magazine's page offers a drop-down box that lists the various subjects it considers interesting, and every one I picked resulted in no hits. For example:

Search produced zero hits. Query: "intranets:keywords"

Indeed, even its free-form inquiry claimed it had never used the word "Web" in an article. Seems unlikely.

Then there's Microsoft. Its Web site

And why is it that the big boys of the network industry are so delicate that they get all uppity over any criticism, however mild?

search facility is famous for being useless.

<digression> I got a very terse message from a Microsoftie today after I posted a note to the Intranet Business Group (e-mail majordomo@silcom.com with "subscribe" in the subject line) about the recently discovered bug in Internet Explorer preview Release 2. He was very annoyed by my "Microsoft bashing."

Now I was simply quoting what Microsoft had posted on its own site and noted the interesting spin doctoring: "Microsoft discovered the DirectX beta file corruption problem during a routine security audit of Java." Ah! It's all Java's fault, not really DirectX at all—or am I just looking for a conspiracy?

And why is it that the big boys of the network industry (Microsoft is not alone in this) are so delicate that they get all uppity over any criticism, however mild? I better watch out for Redmond-based hit squads.

</digression>

Despite all the hype about the power of 'Net and intranet searches, finding things that even vaguely resemble what you're looking for is a hit-or-miss affair.

So the Gibbs Institute of Questing and Frustration would like to receive your nominations for the Best and Worst Search Facilities. Nominations and commentary to "search@gibbs.com".

Stigma #2: A recent column on

Microsoft's new ActiMates product prompted some wonderful remarks from readers. Chris King of Ford Motor Co. sent one of the briefest comments. It simply read: "Daddy, why does my doll keep saying, 'General Protection Fault'?"

Arlen Walker, self-named chief managing director in charge, Department of Redundancy Department, suggested the killer application of ActiMate technology: "You missed the top candidates for post-Barney: Tom Servo and Crow. Imagine sitting through the endless TV rerun season with *MST3K*-style commentary supplied by your ActiMate pals."

Here at the Gibbs Institute we want this version. Now.

Stigma #3: We watched a program on television last night in which they used a hidden camera to investigate some aspect of modern life. The section on food hygiene in various fast-food chains was gut-wrenching.

The next item was about racial discrimination. Two guys who went to college together—one black and one pink—went out separately to buy a car, buy clothes and find somewhere to live. The difference in their treatment was astounding! It is shocking to realize that discrimination is alive and well.

This made me wonder about the IT world. Is discrimination a problem? I have no idea, but I'm counting on you to let me know.

Other than your nominations as discussed above, send comments, musings and small, unmarked bills to nwcolumn@gibbs.com or mutter your message on (800) 622-1108, Ext. 504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

THE WALRUS WAS BILL Microsoft applications creator Charles Simonyi created a stir recently by comparing Sun Microsystems' Java programming language to *Mickey, Dave, Peter and Mike*, those fabulous Monkees.

"It's the Monkees. They had a few hits and then disappeared," Simonyi says in an August *Forbes* magazine interview. "Java will be the same. It will be totally forgotten."

This obviously is nonsense. Even if Java does fade from the hit parade, there's always syndication on Nickelodeon, not to mention those lucrative summer oldies tours. In fact, we bet Sun CEO Scott McNealy could do real justice to "(I'm Not Your) Steppin' Stone."

Of course, Java's reign at the top of the charts shows no sign of ending soon. Javamania continues to grow, despite some performance problems—and despite Microsoft's best efforts to derail it.

But back to Simonyi, who goes on to make an even more outrageous comparison—"Microsoft is the Beatles"—that drew the ire of **Java Developers Lobby** founder Rick Ross.

"Microsoft Word and Microsoft Excel are nowhere near as creative or memorable as 'A Hard Day's Night,' 'Hey Jude' or 'Let It Be,'" Ross says.

No argument here, though we would give Internet Explorer 4.0 the edge over "Yellow Submarine," which, in our opinion, never really got out of beta.

NETCENTRIC SHUFFLE RAISES QUESTIONS NetCentric Corp. founder Sean O'Sullivan says he's "going to Disney World"—his metaphor for taking a vacation from the technology industry.

O'Sullivan announced last week he was stepping down as CEO of the Cambridge, Mass.-based company he founded in 1995. In his place he has tapped **Wellfleet/Bay Networks** founder Paul Severino, who becomes NetCentric's chairman of the board and acting CEO (see story, page 27).

Some Route 128 insiders say the highly regarded Severino, an early investor in NetCentric, is the ideal choice to move the Internet infrastructure software maker to the next level.

"Paul is a real, real heavyweight," said the founder of another Cambridge-based Internet start-up.

But others say Severino is on nothing less than a rescue mission.

"He's been brought in to save them," says one source.

O'Sullivan, for his part, dismisses the doomsayers. "Sure there's risk ahead for NetCentric," he says. "But the company has a very bright future."

MORE THAN JUST ANOTHER START-UP BID A Boston-based start-up vows to succeed where others have failed in the online business-to-business transaction market.

The formula that **FairMarket, Inc.** plans to employ mixes cutting-edge Web technology with an old favorite—auctions.

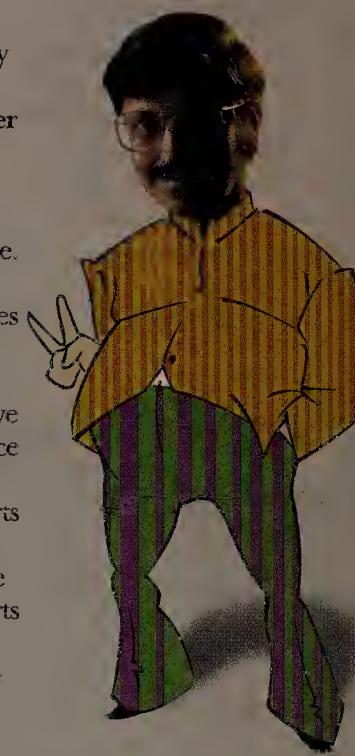
FairMarket founder Scott Randall said the privately funded company is targeting buyers and sellers of excess semiconductors and computer products. It's this narrow market focus that will allow FairMarket to avoid the fate of companies such as **Nets, Inc.**, Randall says.

"Being everything to everybody has never worked in any other business," he says.

FairMarket will schedule real-time auctions in which buyers can engage in online open bidding for excess inventories. Winning bidders get the merchandise, and sellers get the cash minus FairMarket's transaction fee.

The online auctions don't begin until early next quarter, according to Randall, but buyers and sellers can preregister at www.fairmarket.com.

A little-known fact: If you take any Microsoft Office application and run it backwards, you can hear Bill Gates muttering, "I buried Apple." Send 'Net Buzz your little-known facts about the latest Internet and intranet news. Contact Chris Nerney at (508) 820-7451 or cnerney@nwfw.com.



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